Volume 20, No. 6 June 2001

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Monitoring Times

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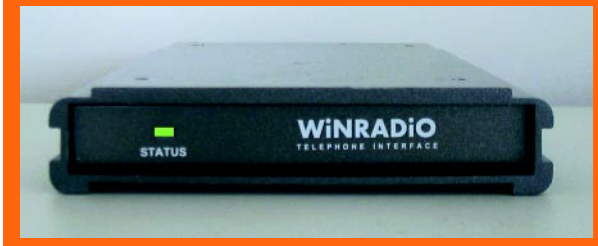

WTCI mounted under a WR-3150e receiver (front view).

WTCI mounted under a WR-3150e receiver (rear view).

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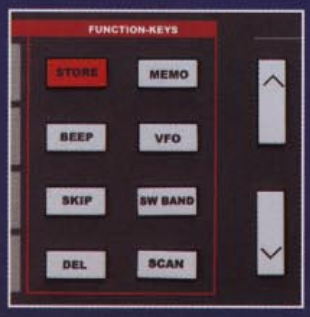

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Monitoring Times

Vol. 20, No. 6 June 2001

On our Cover

Radio on the Railroad

By Matthew Sadler

With a system that stretches from coast to coast, comprised of goods and personnel constantly on the move, railroads have always considered communications of prime importance. Today, besides being used for routine voice communications, radio signals are used for dispatching, traffic management, defect detection and data reports, and even remote engine and brake control.

A table of the new narrowband frequency allocations is also provided in the article starting on page 10.

Pictured on our cover is steam engine 610, operated by the Tennessee Valley Railroad Museum, and photographed by Matthew Sadler. Like most steam engines today, #610 is radio-equipped.

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A Guide to the "Radio Web" 14

By John Catalano

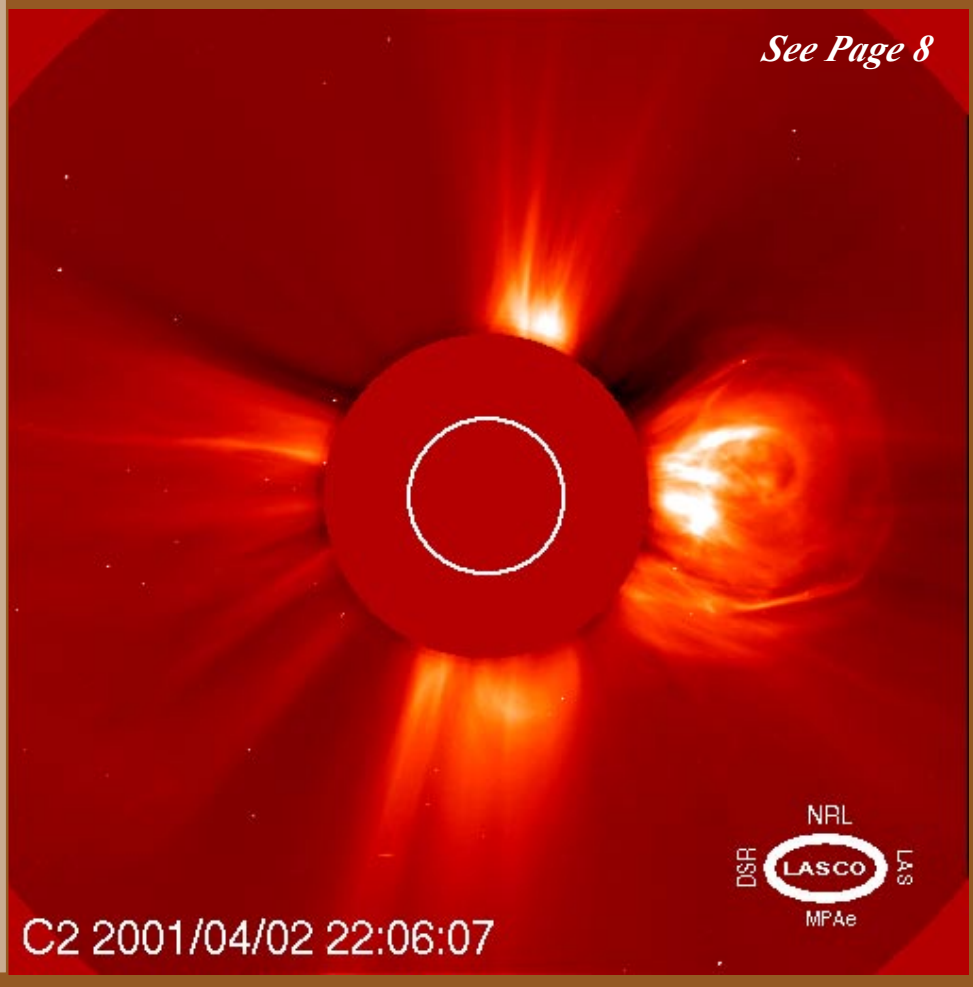
As everyone knows, the internet can lead you to invaluable stores of information or to the town dump – information recycled so many times it's now junk. This "Radio Monitor's Internet Site Resource List" was compiled by *MT*'s own Computers & Radio editor as a recommended list of bookmarks. Whether you're interested in Low, Medium, High, or Ultra High Frequencies, try these sites for outstanding frequency, identification, or link databases. Visit the *MT* home page for quick links to the URLs mentioned in this article.

International Radio: from Conflict to Cooperation? 20

By John Figliozzi

In an article based on issues addressed at the *Challenges for International Broadcasting* conference, *MT*'s Program Manager introduces readers to some of the hard decisions facing broadcasters, especially publicly-funded ones. Is their prime responsibility to the needs of the country backing the station or to the needs of the country receiving the message? What is the role of international broadcasting in dealing with conflicts, promoting peace and encouraging cross-station cooperation?

When radio can impact history as violently as it did in Rwanda, its influence can no longer be underestimated.



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Reviews:

Catalano has been drooling over the CyberGuys' catalog and has found some terrific accessories – including the @ Power strip which will make up for the missing AC outlet on your new computer. He also likes their Power Strip Liberator (to accommodate space-hogging wall wart power supplies) and Catch-a-Call for folks whose one phone line serves for both voice and internet connection. Also check out The Total Office by Olitec: it's much more than a modem. (Page 80 for all.)

Hobbyists have been anticipating the full-featured Alinco DJ-X2000T, and with good reason. This top tier, wide coverage, handheld receiver sports a number of outstanding features, including Flash Tune, rapid charger, and more memories than you'll ever use. Bob Parnass reviews its VHF/UHF performance on page 82, and Bob Grove reports on its HF operation on page 84.

Other reviews include the Hamtronics wideband preamplifier (p.86), and First Alert weather radios WX-17 and WX-30 (p.87). We also provide a correction to the VR-5000 manual on how to perform a programmable memory scan (p.86).

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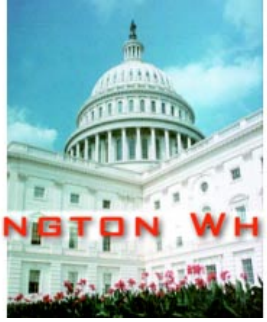


WASHINGTON WHISPERS

Fred Maia, W5YI

Ham Operator Runs Unlicensed Militia Station

Last December, the Federal Communications Commission cited two Amateur Radio operators for operating on high frequency spectrum that was not authorized by their ham radio licenses. Both are leaders in the militia movement. The Kentucky State Militia (KSM), "...a group of armed American patriots who oppose the powers of the federal government" is one of many militia-type organizations that appear to be at war with the United States. Its radio activities have been under investigation by the Federal Communications Commission since it apparently uses ham and other frequencies for its communications and broadcast needs. KSM does not recognize U.S. government or FCC authority.

The U.S. militia movement

According to the FBI, the growth of the organized American militia movement represents one of the most significant social trends of the 1990s. Few Americans knew of the militia movement or anti-government extremists until the morning of April 19, 1995, when a bomb blast destroyed the Alfred P. Murrah Federal Building in Oklahoma City, Oklahoma. Although no apparent direct connection exists between members of any militia group and the bombing, those arrested held and expressed views supported by some militia groups.

The stated goal of the militia movement is to defend and protect the United States Constitution from those who want to take away the rights of Americans. The federal government's role in various confrontations have further fueled conspiracy beliefs that the government is becoming more brutal and is attempting to reverse constitutional guarantees. The Freemen believe they have the right to renounce their citizenship, after which they do not have to comply with any laws or rules and the federal government would have no influence over them.

Many militias claim to represent the beliefs of the founding fathers that predate the Revolutionary War. Colonists at that time rebelled against the British government's practice of oppression and unjust taxation. Various present-day militias pattern their actions on what they believe their ancestors would do if they were alive today.

The FBI focuses on radical elements of the militia movement capable and willing to commit violence. Now a new militia concern has emerged. The illegal use of unlicensed radio communication.

The Kentucky State Militia

KSM is headed up by "State Commanding Officer" Charlie Puckett (Nicholasville, Kentucky) who holds Amateur Radio station license KF4ZMG. Puckett was censured by the FCC for operating on 80 meters (3.860 MHz), a frequency not authorized to Technician Class licensees. Puckett denied the violation, stating that the transmissions were under the "control" of Stephen Anderson (AA8DP), who, as an Extra Class ham operator, is licensed for operation on that frequency.

Kentucky State Militia Radio (KSMR) was engineered and hosted by KSM "Major" Steve Anderson (Somerset, KY). Anderson was also warned by the Federal Communications Commission in December for his operations just below the 40-meter ham band on 6.890 MHz, a frequency not authorized to Amateur Radio at all. Puckett denied monitoring reports that the KSM or its members were involved in the alleged transmissions, which reportedly jammed WWFV, a licensed commercial shortwave radio broadcaster operating out of Copperhill, Tennessee. WWFV transmits on several HF frequencies including 6.890 MHz during the evening.

When the FCC requested specific details from Anderson about the Puckett 80 meter transmissions, Anderson returned his Amateur Radio license to the FCC claiming that the agency "...is an agent of a foreign corporation" with no authority over his radio operation. Expounding the Freemen philosophy, he also stated that he does "...not reside in any territory or possession of the Federal Government of the United States of America..." and that he was "...not subject to any regulation by this fictitious entity."

Anderson launched unlicensed KSMR on March 3 and broadcast nightly on 3260 kHz USB between 0300 and 0400 UTC. The live programs, supposedly sponsored by the KSM, began with a song called "Take My Gun (From My Cold Dead Hands)" and militia announcements. "...And then," according to a *Clandestine Radio Watch* (*CRW*) writeup, "...proceed into a commentary [on] Christianity, alleged U.S. government cover-ups, and justifications for the existence of patriot militia movement – which perceives itself to be defending the country against a corrupted and conspiratorial federal government."

CRW said Anderson announced during a broadcast on Friday, March 9, that he received another letter from the FCC, presumably for his transmissions as KSMR. He said there is no point in citing him. "This is the Kentucky Militia station.... We don't want to hear from you [because] you don't have anything to say to us. You don't have any authority over us. We are asserting our First Amendment Rights here and are protecting them with the Second Amendment." The Second Amendment, of course, refers to the right to bear arms. Strong words indeed.

Anderson told *CRW* that KSMR operates at 800 watts using "...an extended-double zep antenna at 110-feet (36 meters)." The antenna, he said, provides for a 3dB gain over a regular dipole antenna, and plans are in the works to employ a 3kW amplifier he called the "rock crusher." *CRW* added that "...the station is already heard coast-to-coast and has even been monitored in Western Europe."

Supposedly on Wednesday, March 14, Anderson tested 6880 kHz and claimed that "the station will soon carry live programming from the Genesis and Heritage radio networks through a satellite feed. If all goes as planned, the station will operate full-time from 9 a.m. (1400 UTC) to 12 midnight (0500 UTC) on 3260, 6880, and 12181 kHz USB..." which is 10 kHz below WWFV "...to avoid interference." But the programming never materialized.

CRW quoted Puckett as saying "KSMR is truly a national effort..." with $2800 in donations collected for the station. Supposedly KSMR is inspiring other militia groups to take to the unlicensed airwaves.

According to CRW, the FCC took KSM's defiance seriously and was planning to close the station, levy a minimum $7,500 fine and seize the transmitting equipment. Anderson said he was "...not worried. There's about 13,000 of us down here...."

According to a web-posted agenda, Anderson was scheduled to teach a seminar on communications and antennas to members of other state militias attending a "major" multi-state rally in April at Norm Creek, Kentucky.

KLSM Commander Puckett, who appears uneasy about a confrontation with the FCC, denied that KSMR is an arm of the Kentucky State Militia, instead it is sponsored "...by militias and patriots all across this country." But the broadcasts mirrored KSM's news content.

On March 21st, KSMR disappeared from 3260 kHz after three weeks of broadcasting. A March 24th *CRW* bulletin said it had "...learned that the operator of KSMR, Major Steve Anderson, may possibly return to the air with a new station. This operation may be a militia-supported station, but may have a different callsign and fewer, if any, ties to the KSM." We have now heard that the station will be called "The United Patriot Network."

(Excerpts for this story taken from *CRW*'s website at: ***http://www.clandestineradio.com/watch/latest.htm***. Info on KSM can be found on the Web at: ***http://www.freekentucky.com/ksm/contents.htm*** and ***http://militia.clarksriver.com***.)

LETTERS TO THE EDITOR

Many thanks to all those who responded with web sites and books for Canadian scanning information! I have forwarded the material to Robert Wyman for use in an upcoming *Scanning Report*, since space is limited in the *Letters* column. We welcome Robert to *Monitoring Times* as a regular contributor beginning this month.

Contrary Contrails

"My April editorial certainly has drawn commentary!" says Bob Grove. "One respondent said he remembered the way plumes from aircraft looked when he was a child, and they aren't the same now. I told him that the appearance of vapor trails depended upon temperature, humidity, content of the exhaust, and winds aloft. His reply: "I had always thought you were objective. It looks as if you have your mind made up." I replied, "Interesting. The same could be said about you."

Here's another interesting reponse: "I'm Operations Manager at KCXL AM 1140 in Liberty, Missouri. I guess you would call us a "patriot" radio station. I discount about 90% of what I hear, which leaves that 10% which might be true!

"One of the topics we've discussed has been jet contrails. We're about 12 miles off the east end of Kansas City International, so we see a lot of planes and contrails. ..."

Photo credit - DoD

Richard Dale went on to enumerate situations in which the government has been forced to admit some responsibility – the Gulf War illness, testing of an 'inert' form of a bug which imitates anthrax at Fort Polk (Louisiana) and at Fort Leonard Wood (Missouri), testing of viruses and venereal disease on civilians, and so forth.

"So what's up with the contrails? I dunno. Yeah, I heard that report about Reston, too. You have to be careful what you believe, because a lot of it is just misleading. However, those stories could be planted just to make us think it's *all* silly. I have heard enough legitimate people say it, though, to make me think there is *something* to it. And the government lies to us all the time."

– Richard Dale, KCXL AM

"Good points, Richard. Yes, those CIA experiments, back in the '50s as I recall, were unconscionable. I was actually a subject of one of them in college. Over a weekend the campus hospital was soliciting volunteers. They were experimenting with the hallucinogen 'mescaline' and fortunately I was part of a control group, so I didn't get the bad pills...

"My general response to the contrails debacle is:

* Has anyone ever noticed that there has been no epidemiological difference among the populations exposed to contrails after all these decades?
* And why do the photos always show the contrails emanating, quite logically, from the rear of the jet engines, and not from spray nozzles?
* And how come prop planes, which don't make contrails, are never caught "spraying the public?"
* And why would spraying be done during the daytime, in full view of millions below?
* Why would thousands upon thousands of pilots, crewmen, and Congressional representatives collude for years to poison their own families, friends, and themselves?

"There's one composite answer to all of this: Because they aren't spraying us!"

– Bob Grove

Tim Gerchmez observed, "Silly conspiracy theories definitely abound these days, especially on the Internet. If I were asked to describe the Net to someone back in the 17th century, using common language, I would describe it as 'a place where everything spreads.' That seems to sum up the Internet perfectly, as seen here. Files spread, Emails spread, viruses spread, information spreads, misinformation spreads... the list just goes on forever. Given the innate nature of the Net, it's no surprise that every conspiracy theory that can be dreamed up just spreads right along with every other sort of information.

– Tim Gerchmez

John Mayson contributed a few others to the conspiracy theories making the rounds:

* Denver International Airport is actually designed to be a giant concentration camp.
* Timothy McVeigh is innocent. He's been drugged to confess. The government blew up the building to discredit the patriot movement. We're being told he doesn't want an autopsy, but the truth is the mind altering drugs used on him would be discovered during an autopsy.
* Hoof and mouth disease is a UN plot to make us all vegetarians.

What Shortwave Station in Ireland?

Referring to the March feature, *Listening in on Europe*, Glenn Hauser said, "tell me more about Voice of Russia via Ireland. That's news to me. There are no (legal) SWBC transmitters in Ireland."

Author David White provided the B00 HFCC Database listing under Ireland from which he got the information:

Voice of Russia: 0000-1900 Daily	Freq: 6200
Transmitter Location: 53.21N 6.16W	Azimuth: 0
Power: 10,000 watts	Location: 43.12 N 131.51 E
Target: CIRAF Zone 27 (wEu)	LOC: 53.21N 6.16W

David: "So, the coordinates are right for Ireland, but a 0 degree beam would be pointed to Eastern Russia and Alaska (a long haul for 10kW), not wEu!"

"Aha," says Glenn. "This is what I suspected. A religious broadcaster in Ireland (I am trying to remember the name) has claimed that Russia has authorized them to use this (or a nearby) frequency. This in itself is extremely strange, but they are using it as legal justification, while they do not have a SW broadcasting license from Ireland. This does NOT mean that V. of Russia is transmitting from Ireland, though one could certainly think so if that is the way the entry reads. Check the geo coordinates! The longitude is somewhere in Siberia, I think. Another instance of 'official' data somewhat at variance with reality.

"All you may hear is the Irish pirate, with much less than 100 kW, which somehow considers itself using a Russian 'allocation' by proxy. This has been going on for years, and I may well have covered it in my column at some point. Seems like it was United Christian Broadcasters (UCB). But all I see on their website now is about satellite broadcasts... ***http://www.ucb.co.uk***

"The Az of 0 could actually mean non-directional."

David again: "It's good to have folks like GH around to keep us straight. I would have thought he would have caught the error in the table accompanying my "South Of The Border" feature (Jan. 2001) – the Radio Vlaanderen Int'l relay listed as being in Puerto Rico is actually in Netherlands Antilles. 'Puerto Rico' got shifted up a line, and should have been on the line with Armed Forces Radio."

Maritime Web Site

Dick Dillman refers *MT* readers to the new Web page of the Maritime Radio Historical Society (MRHS). "If you are interested in maritime radio history, Morse code or would just like to see some photos of some *real* heavyweight radio equipment, this is the site for you. It may be found at: ***http://www.radiomarine.org***

We welcome your ideas, opinions, corrections, and additions in this column. Please mail to ***Letters to the Editor,*** PO Box 98, Brasstown, NC 28902, or email *mteditor@grove-ent.com.* Happy monitoring!

– Rachel Baughn, KE4OPD, editor

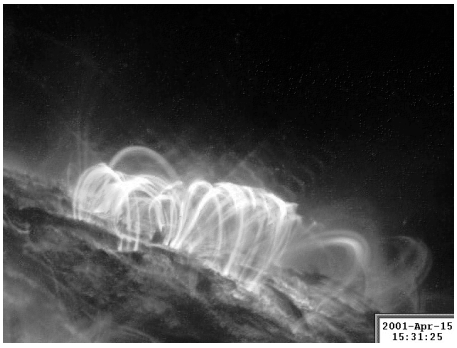
Radio Honor Roll

2001 ANARC Awards

Each year the Don Jensen Distinguished Service Award is presented by the Association of North American Radio Clubs to the hobbyist that exhibits the characteristics of leadership, dedication and outstanding contributions to the listening hobby. ANARC admits that recognition of this year's award winner was long overdue. Marie Lamb, producer of the *DXing with Cumbre* program and promoter of shortwave listening, has over the past few years provided the radio listening hobby with a voice in the very medium that has attracted us to this hobby.

ANARC also awarded a Certificate of Recognition (posthumously) to Gigi Lytle, a friend and fellow DXer whose unbridled passion for the shortwave listening hobby was evident at the many conventions she attended. Gigi made the radio hobby synonymous with the word friendship.

– Mark Meece, *mmeece@siscom.net*; ***http://www.anarc.org/***



Solar Flare Makes History

21:51 UT, Monday 2 April 2001, the sun produced what now appears to be the biggest solar flare on record. Classified as an X20, it is definitely more powerful than the famous 6 March 1989 flare (classified X15) which was related to the disruption of the power grids in Canada.

Fortunately, this one was not hurled directly towards Earth. Had it occurred a day or two earlier, the resulting coronal mass ejection (CME) would almost certainly have been aimed towards Earth. Also, had the flare occurred earlier we could have seen a major proton storm such as the one observed last July, when a number of SOHO's imaging instruments were temporarily blinded.

The active region where the flare occurred is the host of the gigantic sunspot group that drifted across the Solar disk last week. This was the largest sunspot group to occur in 10 years – with a total area 13 times the surface of the Earth at the largest. One of the several coronal mass ejections experienced in April produced a powerful geomagnetic storm that raged for more than 24 hours, dazzling sky watchers who saw aurora borealis as far south as Mexico.

For more information, and great aurora pictures, visit ***http://www.spaceweather.com***

Nearly a Digital Disaster

The New York Fire Department (FDNY) pulled several thousand brand new radios out of operation in late March after six days of use, when numerous system bugs culminated in a firefighter's mayday calls going unheard. No one was hurt, but several investigations have been called for. City councilmen and the Fire Commissioner want to know why the system was not thoroughly field tested before put into service, who claimed the same system had been field tested in Chicago and Boston whereas firefighters in those cities use analog systems, and why the contract was so expensive.

FDNY has ordered 4,000 digital radios from Motorola, and had taken delivery on 2,700. The Fire Commissioner expected the radios to be back in use after a couple of months of thorough examination and testing.

Russian Media Mess

NTV, the only independent television network in Russia – fell under control of the state-connected natural gas monopoly Gazprom in March. Dozens of NTV journalists left the station and refused to work for Gazprom, and some were forced to resign.

Many of them moved to TV6 – a small television station which offered to hire them, whereupon several of *its* journalists and executives resigned, apparently feeling they were being ousted by the newcomers.

It was expected that the former NTV journalists would continue their criticism of the government, but now there are rumors the station owner may sell his 75 percent stake in TV6 to oil giant Lukoil, which is partly owned by the government.

NTV was the flagship of Vladimir Gusinsky's Media-Most enterprise. TV6 is a small station owned by Boris Berezovsky, Russian tycoon and former Gusinsky competitor. Both men are accused by Russia of various fraud-related crimes and both are living in foreign exile. Both claim to be victims of political persecution and could be under some pressure to sell their shares.

Meanwhile, Gazprom has tapped American financier Boris Jordan to head up NTV. Jordan, a third-generation Russian-American, has engaged in private enterprise in Russia since 1992. Critics in both hemispheres have their own questions about how Jordan has accumulated his wealth. Supporters of independent television say he was simply installed as a front.

"Welcome to the past," says Gusinsky.

Three strikes against on-line broadcasters

Major broadcasters who have been streaming their audio content online have found themselves dealing with copyright and performance issues of enough significance that several networks pulled their online content entirely in April.

The disputes are on three fronts. One is with trade groups that represent actors and singers used in commercials. These associations have a provision in their contract requiring that ad agencies pay an additional amount to performers if radio commercials are also broadcast on the Internet. To avoid paying the fees, ad agencies ordered radio stations to delete the commercials in their Web content. Broadcasters are still looking for ways to remove radio ads and substitute Internet-only commercials.

BULLETIN BOARD

June 2: Atlanta, GA

Atlanta Hamfest at 116 Acre Jim Miller Park, Marietta, GA; 9a.m.-4p.m., adm $5. Tail-gating and indoor market, Camping, Prizes, Food, VEC testing, forums. For more info contact John Talipsky, KA4VQH, Hamfest Chairman at johnjr@talipsky.com, or Penn McClatchey, K4PE, President, Atlanta Radio Club at pmm@saf.com

June 3: Chelsea, MI

23rd Chelsea Ham and Antique Radio Swap at the Chelsea Fairgrounds on Old US 12, 8a.m., Adm. $5, talk-in 145.450-. Prizes, coffee and donuts. Information WD8IEL@hotmail.com or Bill Altenberndt, WB8HSN, 19501 Bush Road, Chelsea, MI 48118.

June 3: Manassas, VA

Manassas Hamfest sponsored by Ole Virginia Hams ARC, at the Prince William County Fairgrounds (1/2 mi. south of Manassas on Rte 234), Talk-in 146.97-, 224.660-, 442.200+, 7a.m., Adm $5 at gate. Exhibits, outdoor tailgating, prizes, food. VE testing contact Ruth KU4WH 703/331-1234 or Frizzy2@aol.com ; general info Mary Lu KB4EFP 703/369-2877 or mblasd1638@aol.com or visit http://www.qsl.net/olevahams

June 3: Queens, NY

Hall of Science Amateur Radio Club hamfest at the NY Hall of Science parking lot Flushing Meadow Corona Park (47-01 111th St), 9a.m.; talk-in 444.200, PL 136.5, 146.52 simplex, Adm $5 donation. Free parking, vendors, refreshments. VE exams 10a.m. For info call Stephen Birnbaum WB2KDG (night) 718-898-5599, wb2kdg@bigfoot.com. VE info LMenna6568@aol.com

June 10: Bethpage, NY

LIMARC Electronics Hamfair at Briardiffe College, 1055 Stewart Ave, Talk-in 146.850 (PL 135.4), 8:30a.m., adm $6. Outdoor tailgating. For more info visit http://www.limarc.org or email hamfest@limarc.org or call 24-hr info line 516-520-9311.

June 16: Dunellen, NJ

Raritan Valley Radio Club hamfest at Columbia Park near intersections of Routes 529 and 28, 7a.m.-2p.m., adm $5; talk-in 146.025/625, 447.250/442.250, PL 141.3, 146.520 simplex. Official DXCC and WAS verification. Contact Doug Benner W2NJH, 732-469-9009, wb2njh@aol.com or Fred Werner KB2HZO 732-968-7789.

June 17: Monroe, MI

Monroe County Radio Communications Assoc. Hamfest on Father's Day at Monroe County Fairgrounds (2 mi. west of Monroe on M-50); 7:30a.m. - 1p.m., Talk-in 146.72, adm. $6 . Indoor facilities, distributors, food, overnight camping ($15), VE testing 9a.m. (American Red Cross Bldg; contact Paul Trouten, 734-854-2224) Other info Fred Daele KA8EBI, 4 Carl Dr., Monroe, MI 48162, 734-242-9487, email ka8ebi@arrl.net, web http://www.mcrca.org

A second issue involves royalty payments. Last year, the Copyright Office ruled that stations airing their radio broadcasts on the Web must pay fees to the recording industry. Broadcasters do not believe they should pay anything. But some worry those questions could extend beyond U.S. borders. Because of the Internet's global reach, webcasting could raise international rights issues.

The third dispute is with major league baseball, which decided it would require Internet fans to pay for feeds of game broadcasts. A subscription costs $9.95 for the season. Web radio sites that are not run by brick-and-mortar stations have tried to sidestep these issues by using unsigned artists or original commentary.

Although experts predict these issues will eventually be sorted out, hundreds of stations have stopped streaming on the Internet. Most stations plan to return to the Internet, relying on research which suggests the audience is there and growing. The percentage of Americans who listen to online radio has increased from 5.3 percent to 7.3 percent in the past year, according to a study by The Arbitron Co./Edison Media Research.

However, major radio station group Infinity Broadcasting, a subsidiary of Viacom Inc., has yet to jump onto the internet bandwidth, saying it will wait until it makes financial sense.

Wireless spam

What's worse than telephone sales calls and e-mail spam? Text messaging spam to your cellular phone that you have to *pay* for! You have to read the message before you know who it is from, and as soon as you do, you are charged by the phone company. But, for the advertiser, wireless spam is cheap and easy, and it's a problem that analysts predict will become much worse.

Some lawmakers are looking into applying the 1991 Telephone Consumer Protection Act to the new technology. Cellular providers are looking at ways to provide message headers and some do allow refunds for reading spams. Lawmakers have introduced two related bills in the House. However, even when the payment issue is resolved, you can still count on an increase in wireless junk mail. You just won't have to read it.

Italy Delays Vatican Radio Shutdown

In a short-term compromise, the Italian government has given Vatican Radio until the end of April to negotiate a reduction in its electromagnetic emissions, and the broadcaster said it was satisfied with the decision. The compromise supports the call to have Vatican Radio abide by Italian law while giving it more time to do so.

While an Italian prosecutor has charged that Vatican Radio violates the standards on electromagnetic fields, the Vatican says the transmissions are in line with less strict international standards and maintains that it is shielded from Italian law as an independent city-state.

However, Vatican Radio offered to drop half of its medium wave transmissions following the Easter broadcast. The joint commission was to come to an agreement on the broadcaster's further compliance by the end of the month, when they would review the situation.

"Communications" is compiled by MT Editor Rachel Baughn from newsclippings mailed and emailed by our readers. Many thanks to this month's reporters: Anonymous, Albany, NY; Ken Hydeman, Xenia, OH; Kevin Klein, Neenah, WI; Doug Robertson, Oxnard, CA; Richard Sklar, Seattle, WA; Alan Stoddart, Brooklyn, NY; Robt Thomas, Bridgeport, CT. Via e-mail: Roger Cravens, Robert Felton, Lawrence Harris, Jonathan Kammen, Maryanne Kehoe, Larry Magne, Eddie Muro, Bob Padula, EDXP, Ken Reitz, Doug Smith, Larry Van Horn, David Zantow

RADIO ON THE RAILROAD

Story and Photos by
Matthew Sadler

photo credit: Adam Alberti

Ever since the first locomotive pulled a train along railroad tracks out of Baltimore, Maryland, in 1827, America's railroads have searched for technological innovations that would improve both the safety and performance of their operations. Since the 1950s, radio has played a critical part.

Today, railroads continue to make extensive use of their VHF systems, but also operate extensive voice and data networks using 900 MHz band and microwave frequencies. These networks augment telephone systems and carry data on signal and switch conditions. Radio even allows industries to operate their switch engines by remote control, in some instances.

VHF Radio

The oldest, and certainly most familiar radio systems used by American railroads are their VHF voice networks, operating in the 160 and 161 MHz bands. This band was planned and laid out with such forethought that today, almost any locomotive in the nation can operate on any of these networks, as they all use the same channels.

Railroads equip their locomotives with an ***AAR radio***. The Association of American Railroads designed the channel plan so that the only information needed to tune the radio was two numbers – the transmit channel, and the receive channel (see table on page 12). An AAR radio is similar to a CB radio in that, instead of dialing up a frequency as on a scanner or a ham radio, you dial up the two channel numbers. This versatility allows the radio to be used on simplex channels, duplex channels, or on a repeater.

These radios form the first step in a link from the locomotive cab back to the dispatcher's desk. The dispatcher is in complete control of the territory that he commands, and the dispatcher always needs to have voice contact with the crews. Often, there will be two channels assigned to a particular territory – a ***road channel***, and a ***dispatcher's channel***.

As a matter of standard practice, crews will "call" signals (give their train number, location, and what indication the signal is showing) as they pass them, receive automated defect detector reports, and speak with passing crews on the road channel. In comparison, the dispatcher's channel is generally reserved for traffic involving the dispatcher.

While these all operate in the ***160-161 MHz band***, the way they are set up can vary by railroad. For example, in southeast Tennessee, CSX uses simplex channels for both of these functions and varies the AAR channel used as their dispatcher's channel by territory (or subdivision). Norfolk Southern uses a simplex channel for their road channel and a duplex channel for their dispatcher's channel – except they use the same dispatcher's channel over all of their former Southern Railway lines.

While base stations at yards and other key locations are generally manned, the trend over the last twenty years has been to allow a dispatcher to remotely control and monitor a number of base stations. In most cases, the train crew has to enter one or more DTMF (touch-tone) codes to contact the dispatcher, and the dispatcher will see an indication for the base station that is receiving the strongest signal. These base stations can be linked to the dispatch center by company-owned microwave networks, fiber optic or copper cables, or even leased telephone lines.

Just as public safety, cellular/PCS, and other radio users have done, railroads will carefully select the antennas that they use to cover their territories from a base station. While some locations use omnidirectional antennas, the corner reflector antenna design is popular, since it is directional but concentrates its power between 40 and 60 degrees, making it ideal for covering a railroad right-of-way. While this may cause reception problems for scanner listeners, it insures the best possible coverage of the railroad's property.

Antennas mounted on the locomotives are also critical in getting the message through. In the past, the "firecracker" and "skate" antenna designs, so named because they resembled those objects, were popular, but suffered from design flaws and aging, as they were either easy to damage or weren't efficient. Antennas atop a locomotive are subjected to rain, extreme temperatures, blowing dust, and hot diesel exhaust. With the rapid growth in radio applications, railroads were faced with installing more antennas atop their locomotives, causing more trouble with roof leaks and undesired antenna interaction.

Railroad supplier GE Harris developed an innovative solution that combines all the antennas a railroad could need in a single package designed to tolerate the extremes it faces atop a locomotive. The antenna assembly consists of a Lexan radome, concealing four or eight antennas, depending on the railroad's needs. These antennas operate in the 160-161 MHz, 452-457 MHz, and 936 MHz bands, as well as the cellular bands, and also provide a receive-only GPS antenna.

Now owned by CSX, this former Conrail model SD8MAC locomotive generates 5000 HP and is equipped with DP, allowing it to be remotely controlled.

Defect detectors, mentioned above, have helped prevent a number of derailments over the years by automatically detecting hazardous mechanical defects in railcars moving along the iron highways. There are a number of problems that can be caught, depending on the detector's configuration. Some are able to detect overheated wheel bearings, others detect dragging equipment or hot wheels. Detectors installed near bridges with an overhead superstructure or a tunnel can detect loads on a railcar of excessive dimensions – too wide, or too tall.

These detectors, using a synthesized voice, transmit their report usually on the road channel to the train crew. Upon finding no defects, Norfolk Southern detectors in the southeast Tennessee region simply report "no defects," while those owned by CSX will also include the approximate length of the train and the number of axles. It should be noted that these counts are approximate, and while a small variance is acceptable, a widely inaccurate number could indicate troubles.

There are a wide number of uses for these channels, particularly in rail yards and around railroad shops. ***Car department*** personnel may have their own channel to use as they go about their work, performing brake tests on trains ready to depart and fixing broken or damaged railcars. Similarly, ***diesel shop*** crews may also have their own repeater, which can experience heavy traffic as they refuel and service locomotives coming in from a trip.

Railroad police personnel often use 161.205 MHz, simplex, for their communications on the AAR VHF channels, but they may also be found on the local municipality's frequencies, or using cellular telephones. These agents carry the same law enforcement powers on railroad properties as any other police officer, and frequently make arrests of those vandalizing or stealing railroad property or cargoes. The agents also investigate grade-crossing accidents and monitor the tracks for trespassers.

Yard switch crews will often have their own dedicated channels as well. These personnel will take the inbound train and either shove it over the hump, where each car is uncoupled and allowed to coast down the hill into the proper track and couple into other cars going to the same place, or they will switch the cars with the engine attached. When switching some cars – in particular those carrying explosives or select flammable or poisonous goods – crews may be required by railroad policy to keep the engine attached to the car, as opposed to letting it coast free.

These same AAR radios can also provide access, in some areas, to the railroad's telephone system. In some areas, railroads have installed ***autopatches***, identical to what amateur radio operators have used for many years, to provide access to their internal telephone networks. These systems provide crews a convenient and low-cost way to contact industries they serve, coworkers, and dispatchers.

Remote Brake Control

Radio is also used in a critical role on almost every train that operates in the United States to remotely monitor and control the brake pipe air pressure from the rear end. Trains use a brake line that runs the entire length of the train to supply air to apply and release the brakes, but if this line somehow becomes clogged, the engineer would have no way to get the brakes on the cars behind the defective one to apply.

To prevent this from occurring, railroads use a device known as a FRED (flashing rear-end device) or as an EOTD (end-of-train device). This is a small radio that is connected to a valve, which is in turn connected to the end of the brake pipe. These devices not only transmit information constantly about the pressure at the rear of the train, but they also can be used to apply and release the brakes from the rear of the train. All of these devices also feature a bright red flasher that can be turned on and off by the engineer.

FREDs used by most railroads operate on 457.9375 MHz, with a notable exception – Norfolk Southern uses FREDs that transmit on 161.115 MHz. Some FREDs transmit a data burst, while others will transmit a string of DTMF (touch-tone) characters. Since these devices have a small antenna and operate at a low power level, they have a small coverage area. If you are able to receive one of these devices, it's likely that a train is within several miles of you.

Remote Locomotive Control

Not only can brake pressure be monitored and controlled remotely; so can a locomotive itself! Systems manufactured by Cattron, Inc. and others provide belt-mounted controls so that an engineer can stand on the ground and operate the locomotive in either direction, work the brakes, and even uncouple the locomotive from the cars. These systems incorporate "deadman" switches so that if the unit is not vertical, it will stop the locomotive and apply the brakes. Systems such as these are commonly used at small grain elevators and similar facilities. They are also used quite often in industrial facilities where cars of molten metal are moved around: should an accident occur with this molten metal, the engineer can be in a position of safety.

Radio is also used to allow the engineer at the head-end of the train to control helper locomotives in the middle or at the end of the train, in a system known as DPU, or distributed power units. In these cases, if all of the locomotives were placed at the front, the locomotives could overpower the train and break couplers between the cars. With a locomotive at the end, pushing, this is prevented. Using radio to remotely control this helper engine saves the railroad from paying an extra engineer, and it also lets the railroad efficiently run longer trains. DPU is commonly used on unit trains – those trains where the entire train is carrying a single commodity (commonly coal, metal ore, or grain) to a single destination.

Tracking Cars

Radio provides another critical function – asset tracking. Not unlike a barcode, every railroad car and locomotive that is interchanged with other carriers is equipped with an AEI (Automatic Equipment Identification) tag on both sides. These radio tags are usually passive devices and require no batteries or power source to operate – a major advantage. (Battery power tags are available with an average life of 10 to 15 years; their only advantage is that they can be read further away than a passive tag).

The first attempt at designing an automated car tracking system used placards with multi-colored stripes, known as the "Kar-Trak" system. However, when these labels got dirty, the camera readers were unable to recognize them, and this system was scrapped in the late 1970s, being replaced in the mid-1990s with the current AEI system.

An AEI tag works by powering itself from a nearby RF energy field. When a transmitter is aimed at the tag, it uses a small amount of that energy to power itself and send

AEI tags, fastened to the side of every railcar in the nation, have automated the process of tracking cars and shipments.

back a response. This response contains the railroad's code, the car or locomotive number, and other vital information on the car itself. The AEI specifications state that tag readers will transmit on several specific channels between 902 and 928 MHz, and they operate at low power, less than five watts.

Thousands of AEI readers have been installed across the United States and this automated system has proven to be extremely successful and cost-effective. An AEI tag can be reprogrammed many thousands of times, and can cost less than $20 each. With this system, customers can instantly find out the last location of any railcar as it makes its way to its destination.

Microwave Networks

Railroads have also made extensive use of microwave point-to-point technologies. With their need for long-distance communications, using a company-owned microwave network helps avoid paying high rates to a telephone company. The Southern Railway built an extensive network that remains in service.

Some of these networks also carry data, and can be used to allow dispatchers to remotely control base stations along the railroad. While some systems have been replaced by fiber optic cables, they continue to offer an ideal combination of cost effectiveness, reliability, and versatility to the railroads which they serve, and most networks will continue to exist for some time.

The Future

What does the future hold in store for the nation's railroads? Already, the AAR is studying Positive Train Separation and Positive Train Control systems, which would not only improve safety but would also allow railroads to run more trains simultaneously in one section of railroad. These systems would provide a safety net in the extremely unlikely event that both the engineer and conductor failed to stop or slow their train, or comply with trackside signals.

Also, the FCC's refarming of the VHF and UHF bands will affect the 160-161 MHz band, doubling the number of available channels (see Table). Studies are already underway to see if data and voice can be successfully combined on the same channel. This could allow mechanical department personnel to remotely diagnose troubles on-board a locomotive, or for crews to receive their manifests over the air.

Another anticipated advance is the installation of low-power radar at grade crossings. These radar systems would alert the dispatcher if the crossing is blocked and warn a train crew far more quickly than relying on the driver or witness of a stalled vehicle to call the railroad's communications center. Remember, trains can take over a mile to stop, even when moving at a relatively slow speed, so every second counts.

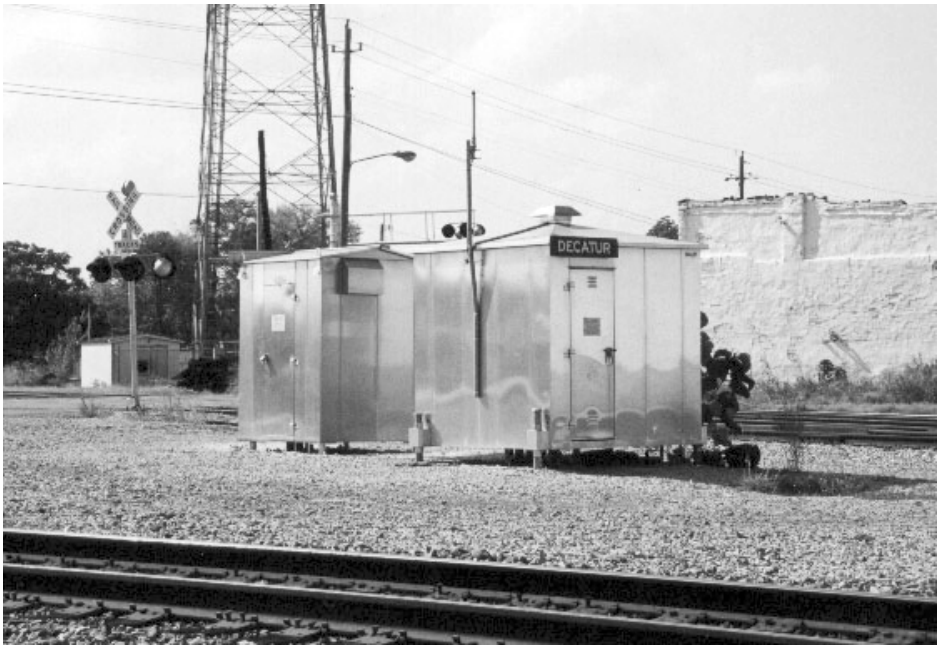
When looking into the future, two things are certain – although America's railroads will continue to be steel wheels rolling on steel rails, new technology will play an ever larger role in advancing safety and productivity. And where you have major transport systems, you will find radio.

VHF/UHF Railroad Frequency Allocations

By Larry Van Horn, N5FPW
Assistant Editor, Monitoring Times

The listing below includes all of the new frequencies created by a brand-new narrow bandwidth VHF band plan recently implemented in the United States by the Federal Communications Commission (FCC). These new narrow band bandwidth frequencies are those indicated by "Bandwidth not to exceed 11.25 kHz" or "Bandwidth not to exceed 6 kHz" in the frequency notes column.

Frequency (MHz)	Station Type	Frequency Notes
159.8100	Base or mobile	<AAR Channel 2> LR Canada Only
159.9300	Base or mobile	<AAR Channel 3> LR Canada Only
160.0500	Base or mobile	<AAR Channel 4> LR Canada Only
160.1850	Base or mobile	<AAR Channel 5> LR Canada Only
160.2000	Base or mobile	<AAR Channel 6> LR Canada Only
160.2150	Base or mobile	<AAR Channel 7>
160.2225	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.2300	Base or mobile	<AAR Channel 8>
160.2375	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.2450	Base or mobile	<AAR Channel 9>
160.2525	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.2600	Base or mobile	<AAR Channel 10>
160.2675	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.2750	Base or mobile	<AAR Channel 11>
160.2825	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.2900	Base or mobile	<AAR Channel 12>
160.2975	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.3050	Base or mobile	<AAR Channel 13>
160.3125	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.3200	Base or mobile	<AAR Channel 14>
160.3275	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.3350	Base or mobile	<AAR Channel 15>
160.3425	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.3500	Base or mobile	<AAR Channel 16>



These prefabricated sheds, located in Decatur, Alabama, house electronics and radio equipment for controlling signals and switches.

160.3575	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.3650	Base or mobile	<AAR Channel 17>
160.3725	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.3800	Base or mobile	<AAR Channel 18>
160.3875	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.3950	Base or mobile	<AAR Channel 19>
160.4025	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.4100	Base or mobile	<AAR Channel 20>
160.4175	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.4250	Base or mobile	<AAR Channel 21>
160.4325	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.4400	Base or mobile	<AAR Channel 22>
160.4475	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.4550	Base or mobile	<AAR Channel 23>
160.4625	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.4700	Base or mobile	<AAR Channel 24>
160.4775	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.4850	Base or mobile	<AAR Channel 25>
160.4925	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.5000	Base or mobile	<AAR Channel 26>
160.5075	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.5150	Base or mobile	<AAR Channel 27>
160.5225	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.5300	Base or mobile	<AAR Channel 28>
160.5375	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.5450	Base or mobile	<AAR Channel 29>
160.5525	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.5600	Base or mobile	<AAR Channel 30>
160.5675	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.5750	Base or mobile	<AAR Channel 31>
160.5825	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.5900	Base or mobile	<AAR Channel 32>
160.5975	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.6050	Base or mobile	<AAR Channel 33>
160.6125	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.6200	Base or mobile	<AAR Channel 34>
160.6275	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.6350	Base or mobile	<AAR Channel 35>
160.6425	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.6500	Base or mobile	<AAR Channel 36>
160.6575	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.6650	Base or mobile	<AAR Channel 37>
160.6725	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.6800	Base or mobile	<AAR Channel 38>
160.6875	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.6950	Base or mobile	<AAR Channel 39>
160.7025	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.7100	Base or mobile	<AAR Channel 40>
160.7175	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.7250	Base or mobile	<AAR Channel 41>
160.7325	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.7400	Base or mobile	<AAR Channel 42>
160.7475	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.7550	Base or mobile	<AAR Channel 43>
160.7625	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.7700	Base or mobile	<AAR Channel 44>
160.7775	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.7850	Base or mobile	<AAR Channel 45>
160.7925	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.8000	Base or mobile	<AAR Channel 46>
160.8075	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.8150	Base or mobile	<AAR Channel 47>
160.8225	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.8300	Base or mobile	<AAR Channel 48>
160.8375	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.8450	Base or mobile	<AAR Channel 49>
160.8525	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.8600	Base or mobile	<AAR Channel 50>
160.8675	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.8750	Base or mobile	<AAR Channel 51>
160.8825	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.8900	Base or mobile	<AAR Channel 52>
160.8975	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.9050	Base or mobile	<AAR Channel 53>
160.9125	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.9200	Base or mobile	<AAR Channel 54>
160.9275	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.9350	Base or mobile	<AAR Channel 55>
160.9425	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.9500	Base or mobile	<AAR Channel 56>
160.9575	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.9650	Base or mobile	<AAR Channel 57>
160.9725	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.9800	Base or mobile	<AAR Channel 58>
160.9875	Base or mobile	Bandwidth not to exceed 11.25 kHz
160.9950	Base or mobile	<AAR Channel 59>
161.0025	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.0100	Base or mobile	<AAR Channel 60>
161.0175	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.0250	Base or mobile	<AAR Channel 61>
161.0325	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.0400	Base or mobile	<AAR Channel 62>
161.0475	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.0550	Base or mobile	<AAR Channel 63>
161.0625	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.0700	Base or mobile	<AAR Channel 64>
161.0775	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.0850	Base or mobile	<AAR Channel 65>
161.0925	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.1000	Base or mobile	<AAR Channel 66>
161.1075	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.1150	Base or mobile	<AAR Channel 67>
161.1225	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.1300	Base or mobile	<AAR Channel 68>
161.1375	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.1450	Base or mobile	<AAR Channel 69>
161.1525	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.1600	Base or mobile	<AAR Channel 70>
161.1675	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.1750	Base or mobile	<AAR Channel 71>
161.1825	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.1900	Base or mobile	<AAR Channel 72>
161.1975	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.2050	Base or mobile	<AAR Channel 73>
161.2125	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.2200	Base or mobile	<AAR Channel 74>
161.2275	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.2350	Base or mobile	<AAR Channel 75>
161.2425	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.2500	Base or mobile	<AAR Channel 76>
161.2575	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.2650	Base or mobile	<AAR Channel 77>
161.2725	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.2800	Base or mobile	<AAR Channel 78>
161.2875	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.2950	Base or mobile	<AAR Channel 79>
161.3025	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.3100	Base or mobile	<AAR Channel 80>
161.3175	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.3250	Base or mobile	<AAR Channel 81>
161.3325	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.3400	Base or mobile	<AAR Channel 82>
161.3475	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.3550	Base or mobile	<AAR Channel 83>
161.3625	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.3700	Base or mobile	<AAR Channel 84>
161.3775	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.3850	Base or mobile	<AAR Channel 85>
161.3925	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.4000	Base or mobile	<AAR Channel 86>
161.4075	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.4150	Base or mobile	<AAR Channel 87>
161.4225	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.4300	Base or mobile	<AAR Channel 88>
161.4375	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.4450	Base or mobile	<AAR Channel 89>
161.4525	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.4600	Base or mobile	<AAR Channel 90>
161.4675	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.4750	Base or mobile	<AAR Channel 91>
161.4825	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.4900	Base or mobile	<AAR Channel 92>
161.4975	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.5050	Base or mobile	<AAR Channel 93>
161.5125	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.5200	Base or mobile	<AAR Channel 94>
161.5275	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.5350	Base or mobile	<AAR Channel 95>
161.5425	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.5500	Base or mobile	<AAR Channel 96>
161.5575	Base or mobile	Bandwidth not to exceed 11.25 kHz
161.5650	Base or mobile	<AAR Channel 97>
161.6100	Base or mobile	Shared with Maritime Mobile Service (secondary)
452.9000	Base or mobile	
452.90625	Base or mobile	Bandwidth not to exceed 6 kHz
452.9125	Base or mobile	Bandwidth not to exceed 11.25 kHz
452.91875	Base or mobile	Bandwidth not to exceed 6 kHz
452.9250	Base or mobile	Train remote control on secondary basis
452.93125	Base or mobile	Bandwidth not to exceed 6 kHz/Train remote control on secondary basis
452.9375	Base or mobile	Bandwidth not to exceed 11.25 kHz/ Train remote control on secondary basis
452.94375	Base or mobile	Bandwidth not to exceed 6 kHz/Train remote control on secondary basis
452.9500	Base or mobile	Train remote control on secondary basis
452.95625	Base or mobile	Bandwidth not to exceed 6 kHz/Train remote control on secondary basis
452.9625	Base or mobile	Bandwidth not to exceed 11.25 kHz/ Train remote control on secondary basis
452.96875	Base or mobile	Bandwidth not to exceed 6 kHz/Train remote control on secondary basis
457.9000	Mobile	
457.90625	Mobile	Bandwidth not to exceed 6 kHz
457.9125	Mobile	Bandwidth not to exceed 11.25 kHz
457.91875	Mobile	Bandwidth not to exceed 6 kHz
457.9250	Mobile	Remote control allowed
457.93125	Mobile	Remote control allowed/bandwidth not to exceed 6 kHz
457.9375	Mobile	Remote control allowed/bandwidth not to exceed 11.25 kHz
457.94375	Mobile	Remote control allowed/bandwidth not to exceed 6 kHz
457.9500	Mobile	Remote control allowed
457.95625	Mobile	Remote control allowed/bandwidth not to exceed 6 kHz
457.9625	Mobile	Remote control allowed/bandwidth not to exceed 11.25 kHz
457.96875	Mobile	Remote control allowed/bandwidth not to exceed 6 kHz

A Guide To The "Radio WEB"
The Radio Monitor's Internet Site Resource List

By John Catalano

In the 1980s computer bulletin boards (BB) were not commonly utilized by most people. However, for those of us that ran up huge phone bills accessing BBs we knew that this was "the place to be." If you wanted the latest computer, technical, gaming and even radio monitoring data, you could not beat a good BB. While publications in these subjects had to run hard to present information that was less than 45 days old, the BBs were usually updated weekly.

In the mid 1990s we were all wondering what effect the Internet would have on radio monitoring. Would it replace radio monitoring? Well, now we know the answer. The Internet has clearly taken a bite out of *all* media: TV, video rentals, reading books, and yes, ham radio and general radio monitoring.

Let's face it, the Internet is an instant, no license, communication media available to almost everyone. In 1997 17% of US households had Internet access. At the end of 2000, this number jumped to over 70%! Email is now the preferred form of two-way communication for many people.

But the Internet is also a one-way communications media. There is no question that the Internet has brought to our fingertips an unimaginable wealth of information, on a nearly inconceivable number of subjects. It's like having all the libraries of the world, all corporate records and everyone's personal hobby files, all on your bookshelf.

Higher Frequency of Frequencies

And radio monitoring? How about weekly updates of commercial AM, FM and TV stations? Could you use daily shortwave, longwave and scanner frequency updates? Hourly updated frequencies for shortwave utility stations? And, would you believe, almost real-time updating of propagation conditions and rare ham stations on the air?!

Yes, these frequency databases are all real and available free to anyone on the Internet. Add to this, identification databases such as for military and civil aircraft, and radio monitoring has become a real-time, changing-by-the-minute activity!

Where Do I Get Some?!

The goal of this article is to provide a solid, tested, up-to-date (at time of writing) radio monitoring Internet resource of websites providing frequency and identification databases. We have tried to group the sites so this resource will be useful regardless of your radio monitoring preferences. We have also compiled a list of websites that provide useful, general monitoring information.

With the huge amount of sites on the Internet and the rapid way they come, go and change their address, this is a daunting task we've undertaken. Although the websites included in the article have been monitored for timely, useful radio data over the past months/years, and addresses have been confirmed as of writing, be prepared for changes. Also, some of these pages may not be direct, but through referral sites. Later, we'll talk more about what can be tried if a link does not work. But now, let's log on and get going, starting at the low end of the frequency spectrum.

LONGWAVE

The part of the frequency spectrum below 550 kHz, where you can monitor coded broadcasts to submarines, European broadcast stations, navigation beacons, time stations, and even natural sounds generated by the Earth.

http://www.lwca.org/

This site has it all for the "lowfers" among us. Databases for Non Directional Beacons (NDBs) and Canadian Navigational Beacons should not be missed. These can be found on the LF Utilities Stations page. The Message Board page can also provide timely information.

http://www.ajpotts.fsnet.co.uk/

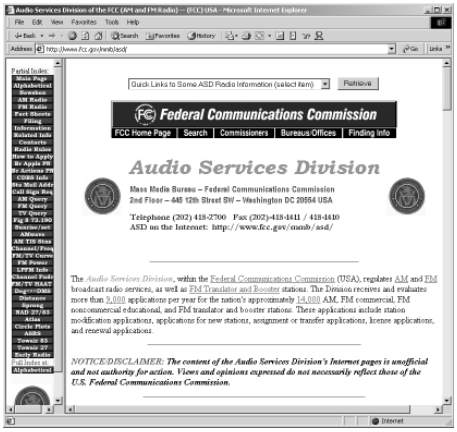
AJP's longwave frequency database is a good place to start for European monitors, including lowfers. This database is small but lists common longwave broadcast stations. This site has basic lists for frequencies from longwave through microwave.

Check some of the shortwave sites listed below for more longwave stations.

AM/FM/TV COMMERCIAL STATIONS

http://www.fcc.gov/mmb/asd/

In the US, the Federal Communications Commission (FCC) is the licensing authority and maintains a database of its AM, FM and TV licensees. This site allows you to search the databases by frequency, location and call sign.



http://www.airwaves.com/fccdb.html

A number of sites access the FCC data, but use different search engines. Each engine has a different user interface resulting in input and display variations. This is one such engine.

continued on page 16

GROVE

ICOM

PCR100	RCV 44	$199.95
PCR1000	RCV 45	$349.95
R75	RCV 32	$574.95
R8500	RCV 14	$1469.95*

SONY

ICF-2010	RCV 2	$349.95
ICF-SW77	RCV 10	$469.95
ICF-SW7600GR	RCV 1	$174.95

AOR

AR-5000 Plus 3	RCV 42P	$2139.95*
AR-7030 Plus	RCV 17	$1499.95*

SANGEAN

ATS-505	RCV 4	$129.95

WiNRADiO

WR-1550 (External)	RCV 47-E	$549.95
WR-1550 (Internal)	RCV 47-I	$499.95
WR-3150 (External)	RCV 48-E	$1849.95
WR-3150 (Internal)	RCV 48-I	$1849.95
WR-3500 (External)	RCV 49-E	$2395.95
WR-3500 (Internal)	RCV 49-I	$2395.95
WR-3700 (External)	RCV 50-E	$2895.95
WR-3700 (Internal)	RCV 50-I	$2895.95

GRUNDIG

Satellit 800	RCV 33	$499.95
Yacht Boy 400 PE	RCV 22	$184.95

DRAKE

R8-B	RCV 3	$1349.00*

JAPAN RADIO COMPANY

NRD-545	RCV 21	$1799.95

GE

SUPERADIO III	RCV 5	$59.95

YAESU

VR5000	RCV51	$899.95

Shipping/Handling Charges

Total Order	*Shipping Charges*
$1-$99	$5.95
$100-$399	$7.95
$400-$899	$11.95
$900-$1499	$15.95
$1500-$1999	$19.95
$2000-$2499	$23.95
$2500+	$27.95

price includes shipping within the US
Prices subject to change without notice.

PALSTAR

R30	RCV 18	$495.95
R30 w/Collins filter	RCV 18C	$549.95

ANTENNAS

AOR SA7000 Super-wide receiving	ANT39	$199.95
Active Duck	ANT 36	$39.95
Grove Skywire	ANT 2	$29.95
H800 Skymatch Active	ANT 15	$129.95*
Select-A-Tenna	ANT 21	$59.95
Super Select-A-Tenna	ANT 40	$189.95
Sony AN-LP1	ANT 26	$89.95
WiNRADiO AX-31B	ANT 4	$119.95
WiNRADiO Antenna Distribution Unit 3 in/6 out	ANT 37	$9,799.95
WiNRADiO Antenna Distribution Unit 4 in/8 out	ANT 38	$11,799.95

ACCESSORIES

ICOM RECEIVERS		
UT-106 DSP upgrade kit	ACC 16	$139.95
Remote control software for R75	SFT 24	$79.95
OPC-131 DC Power Cord	DCC4	$11.95
SONY RECEIVERS		
AC adaptor for SW7600G	PWR 9	$19.95
AOR RECEIVERS		
CTCSS for AR5000 & AR5000+3	ACC 96	$99.00
WiNRADiO RECEIVERS		
FSK decoder	DEC 1	$349.95
Portable power supply	PWR 5	$189.95
Digital Suite software	SFT 15	$85.00
Database Manager software	SFT 16	$44.95
Trunking Software	SFT 23	$89.95
USB Adaptor for External Models	ACC2	$49.95
Telephone Interface for External Models	ACC6	***$Call***
DRAKE RECEIVERS		
VHF converter	ACC 43	$219.95 + $65 installation
External Speaker	SPK2	$48.95
JRC RECEIVERS		
Wide-band converter (less cellular)	ACC 11	$349.95
High stability crystal	ACC 12	$99.95
MISCELLANEOUS		
Scancat Gold for Windows	SFT 2W	$99.95
Scancat Gold for Windows SE Upgrade	SFT 2SE	$59.95
Speco Speaker	SPK1	$19.95

Grove Enterprises, Inc.
(800) 438-8155; (828) 837-9200
(828) 837-2216 fax
7540 Hwy 64 W; Brasstown, NC 28902
order@grove-ent.com
www.grove-ent.com

http://www.entrenet.com/mizar/card/masters.html

Here is the Canadian counterpart for the AM band.

http://Home.InfoRamp.Net/~funk/

This site's search engine links to the FCC, Canada and other MW (AM) frequency data. But sure to check the MW club links for more LW information.

http://dxworld.com/dxnews.html#AMDX
http://dxworld.com/bcblog.html

The DxWorld site is a must for all AM and SW monitors. From here you can access many searchable lists. The two DxWorld pages above will provide you with up-to-the-minute broadcast band AM/MW happenings.

Click on their "Interactive DX Pages" title, situated at the top of these pages, to see all the topics covered in their "live" bulletin board style pages.

SHORTWAVE BROADCAST STATIONS

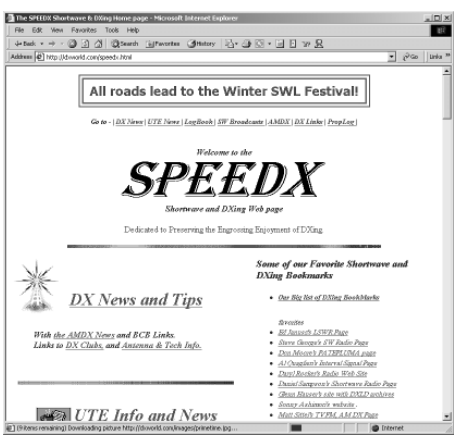
This is a target rich environment with lots of sites. But many of them provide badly out-of-date data. However, the ones listed here are usually updated regularly and have proven to be accurate over the past months.

http://www.addx.de
http://raven.cybercomm.net/cgi-bin/cgiwrap/~slapshot/addx.sh?
http://dxworld.com/cgi-bin/addx.sh

The ADDX site is one of the best for searchable SWBC frequency lists. Separate searchable lists are available for English language, foreign language, DX programs, tropical frequencies and others. However, if you go directly to the ADDX site you will find it in German. The other links provide what appears to be the ADDX data in English.

http://dxworld.com/speedx.html

SPEEDX is the granddaddy of them all! During the 1970s each of us SPEEDX members sent monthly frequency logs to SPEEDX. Each month a comprehensive booklet of longwave and shortwave frequencies was sent to members, mostly in North America. The guys who ran SPEEDX were great and really dedicated. In the 70s SPEEDX *was* radio monitoring! This site continues in the tradition. Although primarily shortwave oriented, SPEEDX should be checked for any frequency searches, especially below 30 MHz.



Make sure you visit all the "Go to" pages at the top of the SPEEDX page.

http://www.angelfire.com/wi2/shortwave/

This Prime Time Shortwave site should be in your bookmarks if you live in North America. The frequency files on this site are provided in HTML and ASCII formats to make it easier to load it directly into your favorite receiver control program.

http://www.anarc.org/naswa/swlguide/

WWW SWL Listening Guide is an easy to use search engine using the SWBC database by MT's program manager. This is another site to be added to your "Favorites" bookmarks.

http://www.angelfire.com/ok/worldofradio/

Glenn Hauser, like SPEEDX, is synonymous with BC SWLing. His site is a wealth of up-to-date frequency data. Glenn's weekly radio DX shows can be played via audio streaming, from this site. This site also has lots of useful links.

http://www.hard-core-dx.com/

Where can you get the latest world-wide short and medium wave news? Right here. I'll bet some of those Internet filters will have a problem with this address! Click the "Just in!" page for a very hot radio frequency bulletin board. Don't miss this site.

The following sites are definitely worth a click if you are into SWBC:

http://www.ajpotts.fsnet.co.uk/
European full spectrum frequency databases.
http://www.ilgradio.com/
Lots of frequency databases and links!!!!!
http://www.angelfire.com/in/alokdg/freq.html
SWBC frequency lists by UTC.
http://detroit.freenet.org/mare/SWBCSkeds.html
SWBC Schedules.
http://www.odxa.on.ca/tglisten.html
Up-to-date frequency by country SW list.

HF (or SW) UTILITIES

Recent developments in electronics and data processing have greatly increased the difficulties monitoring these stations. Many utility stations have migrated to inexpensive satellite communications. Advances in radios and, more recently, antennae, allow automatic and wide frequency agility, without sacrificing power efficiencies. As a result the utility stations can (and do) move all over the HF spectrum easily and often. Finally, any personal computer can provide both unique signal mode and data encoding. These sites are a must for serious HF utility monitoring. Make sure you check the date of the data for "freshness."

http://dxworld.com/utelist.html
http://www.dxworld.com/utenews.html

Once again in the top three is DxWorld with its UTE Links. Their intercepts cover the full range of utility users from number stations to airliners.

The UTE Bulletin Board is not well supported. Therefore it has moments of brilliance and hours/days of useless information. But it is worth an occasional click.

http://www.wunclub.com/

As its name says, WUN, or World Utility News, is another must for utility monitors. The Utility Files page provides information by topic; for example Russian Merchant Ships. The Archives hold some frequency lists and programs which most utility hounds will find useful.

http://www.ajpotts.fsnet.co.uk/
http://members.aol.com/aibold2/call.htm

Calling European Utility Monitors! The first site will give you a list of European SW Utilities. This can be used in conjunction with the second site listed, which provides a European utilities stations call sign list.

http://www.canairradio.com/canforce.html

Specializing in Canadian airspace, this site really covers the subject with HF frequencies used by Airlines and Canada Forces. It includes a Canadian military aircraft callsign list that anyone in North America will find very useful.

The following sites are definitely worth a click if you are into HF utility stations:

http://www.ominous-valve.com/uteworld.html
Utility World with lots of links.
http://web.inter.nl.net/hcc/Shortwave/Index.html?target=Cover.htm
UTEs by call prefix
http://www.ute-monitor.org/mfd/index.php3
SW Utilities Database – How Current?

HAMS

While we are still in the HF, or shortwave part of the spectrum, we should cover some sites useful in monitoring HF amateur radio operators.

http://ac6v.com/nets.htm

This site will give you a list of all the scheduled (daily/weekly) ham "nets." The topics are varied and go from social to technical to disaster assistance! This is a great site for "reading the mail," the ham term for listening in on conversations. You'll never know unless you give a listen.

http://www.qrz.com/files.html

This site will identify the ham you are listening to, via his call letters. It is an easy to use searchable database of amateur radio call signs.

http://www.dxer.com/

This is where hams come to find out what bands are open and what rare DX is rolling in. This real-time propagation information can be valuable to all types of shortwave monitoring.

http://www.datafast.net.au/4217/

Lest we forget our listen brethren "down under"! This is an Australian ham & TV database.

SCANNERS

Unlike shortwave frequencies, due to the usual line of sight propagation limits of these 30 MHz and above signals, they are only useful to a very geographically localized audience. So, find a site that covers your scanner location, but remember to check the "freshness" of the information.

http://www.cityfreq.com/

Just as it says, this site provides basic local vhf/uhf frequencies sorted by USA cities, and even small villages. It appears to be a subset of the FCC database. This is a good place to start your scanner surfing.

http://www.fordyce.org/scanning/index1.html

One of the oldest and still one of the best sites for all scanner users is Long Island Scanning Resources. This data is more complete and detailed than the previous site. However, it only has frequency lists for the northeast US states. It does provide links to other scanner frequency databases worldwide. But their General Frequencies page, which cover US-wide aviation, federal, weather, railroad and more, makes it worth a visit to all scanner enthusiasts. Don't leave without checking their "Links" page.

http://www.911scanner.8m.com/

Formerly called the National Frequency Database, this site does a good job for US and Canadian scanner frequencies.

http://www.eisa.net.au/~stevep/scanning.html

Making the boldly declared statement that it is the "World Scanner Radio" it really only covers USA, Canada, Australia, UK, New Zealand, Scotland. But it's a good start! Also USAF & NASA frequencies.

http://www.icomreceivers.com/

If you own an ICOM R10, R2, PCR100, PCR1000, R3, R75 or R8500 you MUST visit this site! ICOM has made an arrangement with Percon Corp, a longtime database company, to provide USA frequency information, organized by city, company name, callsign or type of radio service. Then why is this site only important to ICOM radio owners? The reason is that the results of the search are given in a data format useful only to ICOM download software such as RT Systems. (In some parts of the world ICOM download software came with the receiver or is available from the web.) If you have one of these ICOM radios and the download software, then this site will free you of tedious keyboard frequency entries.

http://www.perconcorp.com/datafinder/index.html
Percon Corp … where ICOM shops! So why shouldn't you? Check this page for a wide range of data searches, and even aircraft tracking.

http://www.grove-ent.com/mtfreqex.html
http://www.grove-ent.com/mtreference.html
Oh yes, make sure you check the *MT* frequency exchange and reference pages for US scanner frequencies!

Other scanner sites to check:
http://www.phreak.org/html/freq.html
Scanner database possibly using FCC data.
http://www.geocities.com/dshuffy/scanning/freqs.htm
Odd mix of scanner info.
http://www.frequencyuk.co.uk/
Another UK scanner database.

AIRCRAFT VHF/UHF (Civil & Mil)

These are really signals of opportunity due to their limited range and short transmissions. We need all the help we can get for this type of monitoring, and these sites do a great job helping!

http://www.fallingrain.com/air/airports.cgi?NEW=1
Start here with a searchable database of airport frequencies world wide.

http://www.ThirtyThousandFeet.com/database.htm
The next site to check is this huge civil and military group of databases!!

http://www.scramble.nl/dbmil.htm
Once you hear a military aircraft find out who they are, where they are based and what kind of aircraft they are flying. Click on Scramble's military aircraft serial number and tail code database. Many of the airforces of the world are included on this Dutch site. Also, a database of Dutch registered civil aircraft is on this site. The aircraft photos are spectacular and available for downloading.

http://208.165.194.175/mapping/chart/aptsel.cfm
http://www.vadu.com/english/fbo/usils.html
If you know the three-letter ICAO airport identifier these sites will give you all the airport details you would EVER need to know, including ATC frequencies. If you don't know the ICAO code (shame on you) you can type in the name of the airport. These sites will then provide you with a list of "possibles." Simply choose the right one. But remember the ICAO code for next time.

AeroPlanner.com (the first site listed) provides sectional navigation charts of the airport area and lots more. Look for the METAR weather report page on the second site, ***vadu.com***, for aviation weather reports from around the world.

http://www.canairradio.com/
All of Canadian Airspace, both civil and military, on one site!! Also check out their HF aviation page.

Don't stop yet! Try these aircraft related sites for more useful data and links.

http://www.ajpotts.fsnet.co.uk/
European Airband Data
http://home.wxs.nl/~wekuyt/dmafd2.html
Dutch and Euro military databases.
http://www.airnav.com/
Great Airband links

OTHER

Don't look down your nose at these. These are *not* second class sites! In fact, some are so wide in their monitoring information they fit into almost all of the above categories. So click on!

http://www.qth.net/archive/fedcom/fedcom.html
What will come across next on this almost real-time bulletin board is anyone's guess. But be assured it will be concerned with radio monitoring! Go back to their home page at qth.net. As they say, "from DC to light, the full electromagnetic spectrum is represented here. Click on a specific subject from the "Select List" box. Then click Digest or Archives for a load of information on the subject.

http://www.strongsignals.net/
It goes without saying that Strongsignal.net is a great radio resource. Radio reviews, latest news, links and much, much more.

http://www.frn.net/ace/
One for Clandestine radio listeners with daily logs from the field.

http://satscape.terrashare.com/
An excellent satellite tracking program which also gives detailed frequency information on each satellite. But you'll need a fast computer, or lots of time on your hands.

http://members.aol.com/EdMayberry/InternationalListener.html
The International Listener site is another that you should not miss. It covers shortwave web sites, radio webcasts and has lots of radio links. The monthly Shortwave News page is a must.

http://www.fcc.gov/oet/info/database/fadb.html
Check out all the FCC's frequency assignment databases at this site.

http://www.boulder.nist.gov/timefreq/index.html
Time is on "their" side. This is WWV's time signal site with interesting data and links.

Links & Search Engines

Now that we have a good solid set of Internet radio resource sites, how do we keep it current? In fact, how did we find them in the first place? The answer is threefold.

1. Watch for any mention of possible sources of monitoring information in the newspapers, TV, magazines and other websites.
2. Regular visits to "Link" pages of our resource sites for new, or updated entries.
3. Occasionally plug your favorite radio topics into a good search engine. Then explore the results.

Here are some good sites which fit the bill for Link pages.

http://dxworld.com/swlmarks.html
The Big Kahuna of SW links! Not always the first to get a new link, but it eventually gets there. A must visit.

http://havana.iwsp.com/radio/
The Shortwave Radio Catalog site has lots of radio Links, software and more. The problem is the date on the opening page is October 30, 1999?! Still it's worth a look.

http://www.links2go.com/more/www.agt.net/public/gpnet/gpnet.htm
This site is a real potpourri of radio links. Hey! Try it. It's free you know.

http://home.germany.net/101-2047/radio-tv/rtv_link.htm
This is a varied collection of radio and TV links.

http://swldx.com/links.htm
Lots of useful radio links on this commercial site.

Here are some sites that we have already visited. But their links are so good their link pages deserve a mention.

http://www.anarc.org/naswa/
ANARC
http://www.anarc.org/cidx/links.html
ANARC
http://www.fordyce.org/scanning/index1.html
LI Scanning Resource
http://www.qsl.net/wa8pyr/links.htm
qsl.net

As for search engines, you probably have a favorite, but I suggest you try these as well.

http://hotbot.lycos.com/
The "Search Smart" feature is one of the easiest to use. Just type the exact phrase you are looking for in the box. Then click "exact

phrase" in the first box under "Look for:" Hit SEARCH and you are on your way to exploring possible new sites.

http://www.google.com/

The Google search is FAST! No waiting around here.

The Web Cast Band

Well, we have now come full circle. We started talking about the effect the Internet has had on radio, now let's look at some sites that will provide you with links to radio stations streaming audio programming on the Internet. All you will need is a Pentium 166 MMX, 16 MEG of RAM, a medium size hard drive, a sound card (all modest by today's computer standards) and a reasonable Internet connection.

http://internetradiolist.com/Countries/

The Internet Radio List site has this page specifically for International Radio Stations who stream audio over the Internet. The home page of this site has lots of other categories of radio stations streaming audio.

http://www.squawkident.com/livefeed.html

This site features live audio feeds from air traffic control (ATC) sites in various US, Canada and Australian airports.

http://www.netnowonline.com/scanner/

This time it's live audio from police departments around the US. Also check out this site's Scanner links.

When a Link Doesn't Work

A good method to try before you delete the link is the following: Starting from the Right side of the link, delete the letters or number until you reach a "/" or "com" or "net"

For example, if the site **www.webtry.com/radio/junk**
Does not work, try **www.webtry.com/radio/**
If that does not yield a good link next try **www.webtry.com/**

If you get down to the ".com" or ".net" with no joy, delete the link. You gave it your best shot. It has either moved to a totally different address, or it no longer exists.

Use The Force

A summary of all the links we have mentioned is shown in Figure 1. It can also be found, for easy use, on the *Monitoring Times* web page at ***http://www.grove-ent.com/mtjunelinks.html***

With this Internet Monitoring Resource List, you can now enjoy up-to-the-minute radio monitoring like a professional, no matter what type of listening you prefer. Remember to update it regularly and keep it current. Good surfing and listening!

Internet Resource Website List For Radio Monitoring

*By John Catalano For Monitoring Times (list is at **www.grove-ent.com/mtjunelinks.html**)*

LONGWAVE

http://www.lwca.org/
http://www.ajpotts.fsnet.co.uk/

AM/FM/TV COMMERCIAL STATIONS

http://www.fcc.gov/mmb/asd/
http://www.airwaves.com/fccdb.html
http://www.entrenet.com/mizar/card/masters.html
http://Home.InfoRamp.Net/~funk/
http://dxworld.com/dxnews.html#AMDX
http://dxworld.com/bcblog.html

SHORTWAVE BROADCAST STATIONS

http://www.addx.de
http://raven.cybercomm.net/cgi-bin/cgiwrap/~slapshot/addx.sh?
http://dxworld.com/cgi-bin/addx.sh
http://dxworld.com/speedx.html
http://www.angelfire.com/wi2/shortwave/
http://www.anarc.org/naswa/swlguide/
http://www.angelfire.com/ok/worldofradio/
http://www.hard-core-dx.com/
http://www.ajpotts.fsnet.co.uk/.
http://www.ilgradio.com/
http://www.angelfire.com/in/alokdg/freq.html
http://detroit.freenet.org/mare/SWBCSkeds.html
http://www.odxa.on.ca/tglisten.html

HF (or SW) UTILITIES

http://dxworld.com/utelist.html
http://www.dxworld.com/utenews.html
http://www.wunclub.com/
http://www.ajpotts.fsnet.co.uk/
http://members.aol.com/aibold2/call.htm
http://www.canairradio.com/canforce.html
http://www.ominous-valve.com/uteworld.html
http://web.inter.nl.net/hcc/Shortwave/Index.html?target=Cover.htm
http://www.ute-monitor.org/mfd/index.php3

HAMS (HF)

http://ac6v.com/nets.htm
http://www.qrz.com/files.html
http://www.dxer.com/
http://www.datafast.net.au/4217/

SCANNERS

http://www.cityfreq.com/
http://www.fordyce.org/scanning/index1.html
http://www.911scanner.8m.com/
http://www.eisa.net.au/~stevep/scanning.html
http://www.icomreceivers.com/
http://www.perconcorp.com/datafinder/index.html
http://www.grove-ent.com/mtfreqex.html
http://www.phreak.org/html/freq.html
http://www.geocities.com/dshuffy/scanning/freqs.htm
http://www.frequencyuk.co.uk/

AIRCRAFT VHF/UHF (Civil & Mil)

http://www.fallingrain.com/air/airports.cgi?NEW=1
http://www.ThirtyThousandFeet.com/database.htm
http://www.scramble.nl/dbmil.htm
http://208.165.194.175/mapping/chart/aptsel.cfm
http://www.vadu.com/english/fbo/usils.html
http://www.canairradio.com/
http://www.ajpotts.fsnet.co.uk/
http://home.wxs.nl/~wekuyt/dmafd2.html
http://www.airnav.com/

OTHER - So broad they fit most categories.

http://www.qth.net/archive/fedcom/fedcom.html
http://www.strongsignals.net/
http://www.frn.net/ace/
http://satscape.terrashare.com/
http://members.aol.com/EdMayberry/InternationalListener.html
http://www.fcc.gov/oet/info/database/fadb.html
http://www.boulder.nist.gov/timefreq/index.html

LINKS & Search Engines

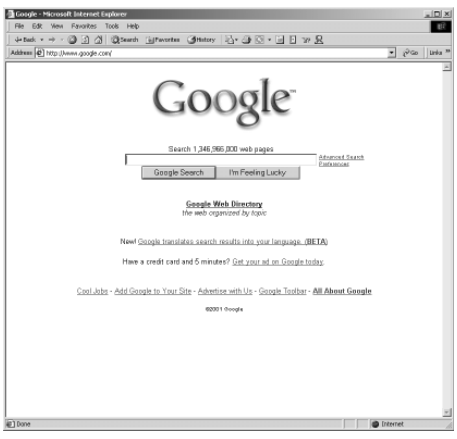
http://dxworld.com/swlmarks.html
http://havana.iwsp.com/radio/
http://www.links2go.com/more/www.agt.net/public/gpnet/gpnet.htm
http://home.germany.net/101-2047/radio-tv/rtv_link.htm
http://swldx.com/links.htm
http://www.anarc.org/naswa/
http://www.anarc.org/cidx/links.html
http://www.fordyce.org/scanning/index1.html
http://www.qsl.net/wa8pyr/links.htm

SUGGESTED SEARCH ENGINES

http://hotbot.lycos.com/
http://www.google.com/

The WEB CAST BAND

http://internetradiolist.com/Countries/
http://www.squawkident.com/livefeed.html
http://www.netnowonline.com/scanner/



International Radio: From Conflict to Cooperation?

by John A. Figliozzi

This is the second in a series of occasional articles prompted by discussions held at the sixth *Challenges for International Broadcasting* conference, which took place in Montreal last year. The theme of this particular edition of these biennial conferences sponsored by Radio Canada International was "Programming: The Heart of International Radio." There will be two more articles in this series leading up to the seventh conference, planned for Toronto in May 2002.

The World Conflicts and International Broadcasting session was chaired by Alan Heil of the VOA (second from left) and included Professor Douglas Boyd of the University of Kentucky (far left).

To recap, in the January issue of ***Monitoring Times***, I described discussions during the early part of the conference that centered on the nature of radio itself and international radio as a distinct form of the medium. References were also made to the challenges and opportunities posed by new communications technologies and an emerging and uncertain global political, social and economic environment.

This month's article gets more specific, as the conference did, about the role of international broadcasting in dealing with conflicts, promoting peace and in recognizing and creating prospects for cross-station cooperation.

Radio and Conflict

Alan Heil, the now retired deputy director of the Voice of America, chaired a session titled "World Conflicts and International Broadcasting." With all of the changes taking place in the world and in the media, whom should international broadcasting be targeting? Heil noted that – the new realities notwithstanding – conflicts and terrorism continue to plague the globe. He suggested that publicly funded international broadcasters, using primarily shortwave, remain the strongest outside voices reaching those in conflict zones.

So, Heil posed these questions: Do crises, conflicts and catastrophes demand unique broadcast services? Should international broadcasters be driven more by the needs of the country which originates the broadcast or the needs of the country receiving the message? He asserted a personal belief that calm and reasoned voices from the international broadcasting community can have an immense impact on the actions of governments and rival factions mired in conflict.

Another speaker provided a stark illustration of the power of radio, although in a most negative sense. According to Morand Fachot of *BBC Monitoring*, the fact that the power of radio has been drastically underestimated in an age of new technologies has had a devastating impact on some conflicts.

Fachot offered the role of "hate radio" broadcasts in Rwanda as a chilling example. In the weeks leading up to the genocide practiced in that country, local radio urged Hutus to take up arms and massacre members of the country's powerful Tutsi minority. Appeals from the Canadian commanding the small United Nations peacekeeping force in Rwanda, General Romeo Dallaire, that the stations be taken off the air were answered by the US ambassador with assertions that such actions would be a violation of international law. Similar examples of the power of radio to promote hatred and violence also occurred in Congo, noted Fachot.

The international community apparently learned its lesson by the time of the Kosovo conflict. Not without criticism from some concerned about press freedoms, NATO directly targeted Serb nationalist radio stations that were broadcasting anti-Albanian messages. Fachot argued that if radio can promote violence, it should also be able to promote peace by broadcasting messages denouncing violence and urging peaceful resolution of disputes. This, he asserted, should be a key role for international broadcasters. He said the signature challenge for them is how they can most effectively get that information to their audiences.

Jean-Gabriel Manguy of Radio Australia concurred with that assessment. He used his own station's experience with the East Timor crisis to illustrate that international radio could not only assist a neighbor in need, but also awaken awareness domestically about the vital and positive role a nation's international broadcaster can play in world affairs in the post-Cold War era.

Manguy pointed out that, as a regional broadcaster, Radio Australia sees its ongoing role as providing reliable news and information to Asia and the Pacific and contributing to development efforts through the broadcast of educational programs that serve the needs of its regional audience. As with its response to crises in Papua New Guinea, East Timor and Indonesia, Manguy said that Radio Australia will remain willing to reformulate its existing services and fashion new services to meet special, immediate and temporary needs within its region. He pointed out that positive recognition for these efforts domestically had already somewhat strengthened the support for Radio Australia within Australia and expressed confidence that this would result in future support for further initiatives in this regard.

Ivan Dario Montoya Osorio of Colombia's TELEUIS, a domestic network of

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university-based radio stations made a direct appeal to the international broadcasters in attendance not to abandon Colombia in its current crisis situation – an ongoing long and bloody civil war without apparent resolution. He gave several examples of how domestic media and journalists have tried to assist the victims of this conflict, often at great risk to themselves including loss of life.

Having the attention of the international community focused on Colombia, in part through the services of international broadcasters, would bring the pressure of world public opinion to bear on the protagonists of the conflict that would benefit the broader population. In this way, he said, international broadcasting would also support and provide a measure of protection for the humanitarian efforts of domestic broadcasters within Colombia.

Professor Douglas Boyd of the University of Kentucky's College of Communications, an expert on broadcasting in the Arab world, pointed out that Arab governments have long recognized the power of radio, demonstrated by their persistent drive to maintain control over the information that is broadcast. This effort – always under some challenge from externally-based international radio – is being further undermined by satellite television and the Internet. But, he pointed out that, from the point of view of the West, this development is a two-edged sword. Extremist elements also are now effectively reaching larger audiences.

Chris Bowers of the United Nations refugee agency (UNHCR) introduced the concept of "crisis radio" into the discussion. Bowers, who has worked extensively in the former Zaire and Rwanda, said that a unique challenge for his agency was reaching and getting aid to refugees who had fled into the bush. He said that the most effective way of reaching these people was through the BBC World Service and other shortwave broadcasting services. These services allowed the agency to send messages about where to go for help and where to assemble for transport to refugee camps. He said this situation was repeated successfully in other conflict zones including Kosovo.

Bowers asserted that only established services like the BBC had the requisite trust of the people necessary to allow these messages to be effective. He appealed to the international broadcasting community not to abandon shortwave in favor of more "high-tech" means such as the Internet. He argued that refugee crises again and again have demonstrated the utility and effectiveness of shortwave transmissions. For people fleeing their homes with little more than the clothes on their back, a small shortwave radio may offer their only link to desperately needed information.

David Gibson, manager of quantitative research for the Intermedia Survey Institute, said that his research in the Balkans supports what Bowers was saying. He said international broadcasting on FM and shortwave was the key link – and sometimes the only link – between people in the conflict zone and the outside world. In addition to general information and refugee support, these broadcasters also told Serbs what it would take to end the NATO bombing campaign. Gibson pointed out that international broadcasters and their sponsors needed to understand the importance of timely, accurate and credible reporting, as well as to be fully aware of the value of their services, during times of crisis.

"Creating" a Culture of Peace

The fourth session of the conference was planned with an eye toward the fact that the year 2000 was designated by the UN as the "International Year of the Culture of Peace." Is it the role of international broadcasting to actively promote a "culture of peace"? Such an abstract concept lends itself to many interpretations. Father Pasquale Borgomeo, director-general of Vatican Radio, chaired the session and sought to provide some concrete definition. He urged participants to explore whether international broadcasters should seek to incorporate values like tolerance, mutual respect and critical thinking in their work.

"Given that we are talking about culture, we should remember that we are talking about an exchange of ideas and values." He identified two tasks for international broadcasters in this regard: (1) contribute to global freedom of information and (2) assist in the reconstruction of media destroyed by conflicts or suppressed by totalitarian regimes.

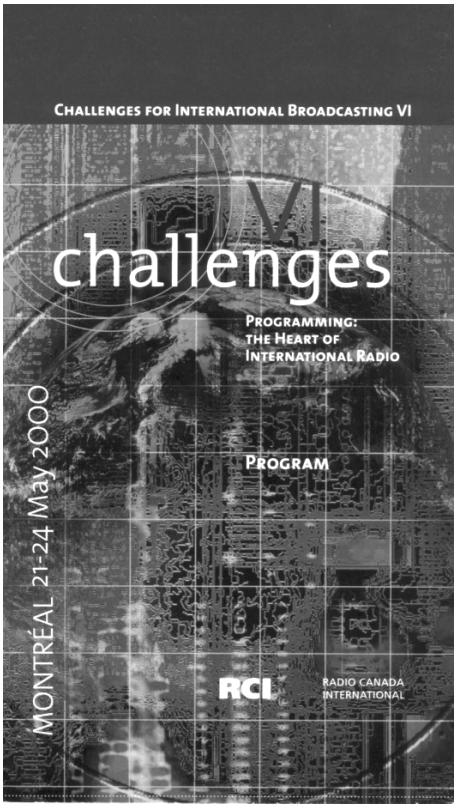
This session, which opened the second day of the conference, introduced a different format that split discussions first into geographical regions followed by a regrouping to share the outcome and content of those discussions.

African participants were critical of the large international broadcasters. They saw the BBC, VOA, RFI and DW as having colonialist roots, possessing an air that was distant and aloof, with an attitude of superiority. They also criticized their style of reporting, seeing conflicts on the continent as little more than "sporting events" with winners and losers. They warned that such a "patronizing attitude" did little to promote understanding and peace and they decried the growing technology gap between the richer countries of "the North" and the economically poorer countries of the "South." They recommended: (1) concrete cooperation between North and South to bring about a greater equality of technologies, (2) stronger support from the North for the development of local community radio, and (3) stronger North-South partnerships between and among broadcasters.

Similar in some respects to their African counterparts, participants from the Asia-Pacific region urged international broadcasters to look beyond surface elements in their coverage of the region by supplying the historical context to events and striving to give a human face to conflicts. A more consistent effort to report on the region was needed in order to ensure that journalists and broadcasters developed a truer understanding of the peoples and issues involved. Asia-Pacific participants complained that coverage of the region by international broadcasters has been sporadic and focused almost entirely on flashpoints and conflicts.

Latin American participants pointed to their region's independent university and community radio stations as keys to the free dissemination of information there. They help to educate the people, promote ideological pluralism and provide a means for the larger population to participate in using the media. Since the work of these stations support democracy and justice, Latin American participants asserted that they serve as "voices of peace." They concluded, on the other hand, that international broadcasters serve as little more than news agencies. Rather, the latter should promote greater awareness of regional problems, such as Third World debt, the sharing of scientific information between North and South and the rights of women in developing countries.

European and North American participants, perhaps owing to a difference in basic philosophies with their Third World counterparts, recommended a less "hands-on" role for international broadcasters. They pointed to existing training programs they were sponsoring for Third World journalists and North-South co-productions as key elements of their efforts. While agreeing that international broadcasters have a vital role to play in reducing and resolving conflicts within and among nations, they argued that reporting accurately and independently was the most that could be done. They pointed out that international broadcasters do not have the capacity in and of themselves to change governments or government policies. But they



allowed that it was a valid criticism of their efforts that they do a rather poor job of covering and explaining the events leading up to, and in the aftermath of, the crises on which they focus, often intently, for all-too-brief periods.

Perhaps the biggest challenge in promoting a culture of peace falls to broadcasters in the Middle East. The Israeli-Arab conflict – and many others in the region – are longstanding and characterized by seemingly intractable positions. This makes them extremely difficult to cover in a way that will foster understanding and retain credibility across differing communities. Middle East participants seemed more ambivalent and less hopeful about the role of the journalist and broadcaster than those in other regions. They called for closer ties among journalists from all sides as a means of promoting greater understanding.

"Cooperation"

This session also was structured as a series of regional workshops, after which participants regrouped to share what they had discussed. Much of the talk from less economically developed regions reprised a theme heard earlier in the conference – the technological divide between "have" and "have not" countries and broadcasters. Many of the Third World participants argued for the developed world to make outright gifts or grants of technology to them.

In this regard, however, Oumar Diagne of CESTI (the University of Dakar's Centre for the Study of Information Techniques and Sciences) argued that this was not to say that cooperation should be in only one direction. The stations of the South have much to offer in the way of cultural diversity to the stations of the North which are serving increasingly more diverse populations, he said. North African and Middle Eastern participants supported this concept: training and technology from the North would be exchanged for the South's willingness to provide better education to the North about developing nations.

In general, the views from less economically advantaged regions – Asia-Pacific, North Africa and the Middle East, Latin America and Africa – coalesced around a common theme. They identified four areas of cooperation with the North that would produce a significant enhancement in their efforts: (1) program distribution; (2) technology transfers; (3) program co-productions; (4) staff training.

Latin American participants complained that the major international broadcasters were closing their services to the region. On the other hand, they reported increased cooperation among broadcasters within Latin America. They also praised the work of Deutsche Welle in providing training and cooperative opportunities to the region's broadcasters and journalists.

African participants pointed to a number of obstacles to cooperation within the countries of the region including language, ethnic issues, a lack of common points of reference, a dearth of balanced reporting, and technical deficiencies. They called for increased opportunities for contacts and cooperative efforts among African journalists as a group and help from the North in the form of improved technology and training.

European discussions centered on more philosophical questions such as whether cooperation within the region would threaten diversity and whether diversity or uniformity was the better value to promote. They also questioned to what extent an individual international broadcaster's responsibility was to its "home" nation as opposed to the needs of its audience outside the sponsoring country.

Interestingly, North American participants, for their part, largely abandoned their own regional discussions in favor of participating in the discussions of other regions.

So, Where Are We?

In sum, as the conference wore on, it was clear that international broadcasters are still bedeviled over defining their roles in the post Cold War era. The good news is that – for the first time – they are confronting this question together and some consensus is emerging. But is there enough time available to allow this process to adequately revitalize international broadcasting? As they say, stay tuned.

More – this time about audience research and the impact of new technologies – in a few months' time.

Further Resources

References are made within this article to "hate radio," the use of the media to foment racial and ethnic hatred and urge a segment of the population to acts of violence and genocide against another segment. Further information about hate radio and efforts to combat it can be obtained from the following Internet sites.

On Radio Netherlands' Media Network "e-zine", a dossier entitled "Counteracting Hate Media." Go to ***http://www.rnw.nl/realradio/dossiers/html/hateintro.html***. On the same site is another dossier chronicling the activities of the Yugoslav media during recent crises in the Balkans. Go to ***http://www.rnw.nl/realradio/dossiers/html/kosovo.html***. Readers that desire to directly monitor broadcasts that may illustrate some of the references within this article to international broadcasting's many roles, can refer to Radio Netherlands' "Hot Spots" section at ***http://www.rnw.nl/realradio/features/html/hotspots.html***.

Radio Canada International maintains an Internet site with information about the Challenges for International Broadcasting series of conferences. This site has lists of participants, summaries of the sessions held at the most recent conference in Montreal as well as on-demand audio files of some of the presentations and interviews conducted by RCI at the conference. Go to ***http://www.defis.ca/***

.

Ken Reitz, KS4ZR
ks4zr@firstva.com

The Readers Respond

Whole House Audio

In the March "Beginner's Corner" I showed how to transmit audio from any source throughout your house using a relatively cheap miniature FM stereo transmitter. That drew a wide response from readers and here are a few things they said.

* "I really did like your March *MT* item on "Wireless Whole House Audio." I have been using another system for a couple of years now – nursery monitors. I have one for my SWL radio, a Magnavox D2999, and one for my serious DX set, a Kenwood R2000. They have advantages and disadvantages vs. your rebroadcaster version.

Advantages: they require no alteration or hardwiring to the source; they have greater range

"Low priced and long ranged, baby monitors can also be used for rebroadcasting throughout your house."

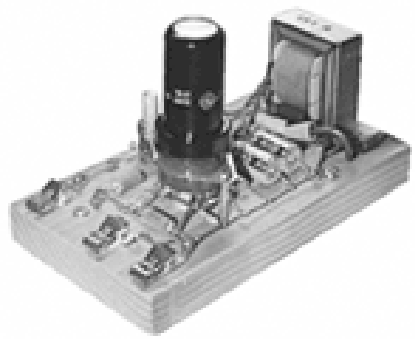
– several hundred feet it seems; they have belt clips; and they are dirt-cheap at yard sales. I can sit out in the park beyond our property and hear fine. A point in this connection: get a unit (Radio Shack, Fisher-Price, and Graco sell them) whose transmitter will take both battery and wall-wart power to facilitate source-switching.

Disadvantages: their audio output is very treble-bright, and their mikes are so hot that placement vis-a-vis the source is important to avoid an echoish sound....use the tone control on the source to cut the treble and to place the transmitter right near the source's speaker. As for power consumption, they are pretty easy-going. But if you use the remote a lot, investing in a couple of rechargeable 9 volt batteries is a good idea. Hope this info proves useful–and thanks again for a very handy article. – *Alan Bosch KO4ALA*

Excellent tips all around, Alan. While I use my system to rebroadcast stereo high fidelity sources (satellite audio in particular), others wishing to monitor ham repeaters or other scanner communications may find your system easier and cheaper where audio fidelity is not a concern. Thanks for the info!

* "Thank you for your excellent article in *MT* on wireless whole house audio. It was clearly written so that those of use who are most interested in the "Beginner's Corner" can successfully follow the instructions. I am using the system to broadcast internet radio from my computer to my stereo system and for broadcasting from my Drake SW8 to other radios in my home. It is a very effective way to extend the reach of the computer and shortwave radio at a reasonable price." – *Philip Spayd, Boston, MA*

* "I thought your idea in using a remote FM transmitter to broadcast signals throughout your house was great! I tried a different approach....I bought a 900 MHz transmitter to be used with headphones and listen on my scanner at 913.45 MHz. The quality is lacking since it's monaural and with limited bandwidth. I will try your approach. One question, why do you say the Rainbow kit from Radio Shack is not considered a beginners project? Do I qualify? I built my first one tube radio in 1937 at age 11! – *Alvin Dattner*



"Alternative to the FM wireless transmitter try building this tube-fired AM transmitter."

Alvin, you're *over*qualified! But, that brings up another interesting possibility, one you might really be interested in: Antique Electronic Supply offers an *AM* wireless transmitter kit patterned after the 1939 Zenith model S-7000 Wireless Record Player. This would allow you to listen to any audio source on any AM radio including some of those old great AM collector sets many of us have. You can check out this tube-driven, flea-powered AMer (#K-488) at Antique Electronic Supply 6221 S. Maple Avenue Tempe, AZ 85283 or call 480-820-5411 or visit their web site at ***http://www.tubesandmore.com***. Cost is $35 plus shipping.

* "Read your article in *MT* and purchased the Arkon SF-120 Sound Feeder with a corresponding AC-DC adapter and alligator clips from Radio Shack...My question: how did you mount a screw onto the positive plate in the battery compartment? The above-described unit has a slightly raised, circular mound for the anode of the battery. Did you use a drill for the hole?..." – *Joe Guerra, KD5CZM*

Yes, Joe, I believe I did drill a tiny hole in the connector and screwed a very small machine screw into the hole allowing the clip to take hold. I also used a file to cut a notch in the battery compartment cover in order to thread the wires through. It wasn't totally necessary, but it made the project look neater.

* "Just got my March 2001 *MT* magazine and noticed your article on FM transmitters. I bought an FX Wave a while back from a company call Heartland America....I think that company [FX Wave] disappeared, and that version of the transmitter was like the one you show having converted to a wall wart supply with alligator clips.

A year or two ago I found that C. Crane [***http://www.ccrane.com***] carried the same transmitter, now called Otomek brand in the package I got, and their version includes a wall wart with a coaxial DC connector plug that goes into the side of the transmitter body. I recall it being in the low $40's. I use it to retransmit audio from shortwave receivers, CD players, etc. as you describe." –*Lee Lumpkin, KB8WEV*

Thanks for the info, Lee. I checked at the Crane website and they have discontinued the

model, but, they may bring it back if there are enough inquiries. Also, as noted in the original article Circuit City carries a very similar unit in their stores.

* "A week ago I was talking with the other guy in our engineering department about my desire to build a little FM transmitter kit for the purpose of tossing stereo audio around in my home. We sure thought it was the height of coincidence when the very next day I picked up the March issue of *Monitoring Times* to find an article by yourself on just that subject. We enjoyed the article even more after reading the article and discovering that your personal use of this application was to extend your satellite receiver audio while tuned to KLON (of all channels to listen to). Thanks for the mention! – *Ron Thompson, Chief Engineer, KLON & Duncan Brode Broadcast Technician, KLON*

Well, Ron, thanks for the comments! It was really KLON which started me on this chase to find a way to do this. Where I live, having a full time jazz station is unheard of and I had been enjoying KLON since the mid '80s. I just had no way to be able to listen anywhere else in the house except where the satellite receiver hooks into the stereo. I originally tried all manner of things including a wireless FM mike which had all the obvious disadvantages.

It wasn't until portable CD players came into vogue six or seven years ago that these transmitters became marketed as a way to play those units through the car stereo. For those of you interested in how to tune in KLON or nearly a hundred other satellite delivered radio stations cheaply, I'll cover that topic in an upcoming Beginner's Corner.

The "Grove" Antenna

In October of last year I wrote about "The Only SWL Antenna You'll Ever Need" which detailed how to build the Grove Tunerless All Band antenna, I call the *GTAB* for short. Many readers wrote in with follow-up questions and I was heartened to see all this antenna building activity. One of the first to complete the project was Dave Palitsch who wrote:

"... I finally got my antenna constructed and in the 'air'. From ease of construction to operating performance, it is everything you said it would be. It is a great 'catcher' and I would recommend it to anyone. I do have a comment or two... First, it appears that performance is affected and sensitive to the angle at the junction of the antenna legs and the twin lead. At least it was for me. Straight and perpendicular are preferred. Second, the higher you can get the twin lead in the air, the better.

"But, however you erect this 'baby', it's a winner! A new friend of mine, George Maroti (a seminar presenter at...SWL Fest) sent me a list of 10 Papua New Guinea frequencies to try. He sent them to me on Thursday, and I gave it a go on Friday AM. UNBELIEVABLE! With the aid of my new off-center fed dipole, I heard transmissions on every one! In closing, thank you for your e-mails which answered my questions and helped make the project a success..." – *Dave Palitsch*

Thanks for writing, Dave, and Happy DXing to you! Remember, if you just started subscribing to *MT* you can get copies of articles which were published last year in this or other columns simply by ordering the *Monitoring Times Anthology 2000 Edition* CD. Call the Grove Catalog number for details.

Other Questions

* "I wanted to write to say how much I appreciate the detailed 10 meter band plan you included in your December 2000 *MT* column. Could you point me to a source for similar detail on the other ham bands? I looked at the band plan on the ARRL web site, but it doesn't give the detail of your chart.... Even though I am not a beginner to shortwave listening, I enjoy your "Beginner's Corner" column. My philosophy is that there is always something new to learn!" – *Bob Barr*, Warminster, PA.

Indeed, you're right, Bob! Best source for band plans is from the ARRL's book *The FCC Rule Book: Guide to the FCC Regulations* by Rick Palm K1CE. It's over 250 pages long and chapter 5 contains 16 pages of Amateur radio band plans. That's probably why they don't give the full details. At $9 it's a worthy addition to any listening post. You can order one directly from the ARRL at their web site ***http://www.arrl.org*** or call 888-277-5289 from 8 am to 8 pm ET Monday through Friday or write ARRL 225 Main Street, Newington, CT 06111-1494.

* "I read with great interest your article in *MT* (Jan issue). I have just gotten my Technician's [license], and have an Alinco DJ-V5 handheld. This HT was an SMA antenna connector. I love the unit's flexibility, but have not been able to easily find the correct cable wiring to connect to the Radio Shack 20-176 you suggest....Please advise."– *Arthur KB1GCH*

There is an adapter for the DJ-V5 which you can get at Amateur Electronic Supply (AES) by calling 800-558-0411. It really makes a difference. My wife has the same HT and could barely make any of the local repeaters from inside her car. We got the adapter and put it on a 1/4 wave mag-mount setting on the trunk of her car and now she gets into all the repeaters.

Ask Bob

Bob Grove, W8JHD
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Q. *Are there any licensees in the 220-222 MHz range taken from the amateurs a few years ago? (Kenneth Pearson, Freehold, NJ)*

A. This is a narrowband, non-government spectrum with 200 channels allocated to base stations in 220-221, and mobiles in 221-222 MHz range. I hear amplitude-compandored sideband (ACSB) in the USB mode near Atlanta from my area of western North Carolina. It appears to be a taxi service.

Q. *My self-adjusting clock has a flashing satellite icon aimed toward the sky, yet the instructions say it gets its time correction signal from WWVB at 60 kHz. Which is it? (Ronald Blocker, Glenwood, IL)*

A. WWVB at 60 kHz. A sensitive receiver with an integral loop antenna picks up the signal from the Time and Frequency Division of the National Institute of Standards and Technology (NIST) near Ft. Collins, Colorado. I guess the fanciful satellite icon conjures up a more space-age image than a dipole would!

Q. *I've heard that in extremely frigid weather, in quiet locations, power lines can be heard to "sing." Why is this? (Mark Burns, Terre Haute, IN)*

A. In the early days of railroad telegraphy, native Americans reportedly put their ears against telegraph poles to listen to similar sounds. While I've never had anyone report hearing this, I can guess how it could happen. Although there is slack in a power line, the cold weather causes the metal to contract as well as harden, like tuning a giant guitar string. Wind and alternating electrical current encourage the cable to vibrate which could generate the sound. I wouldn't be surprised if some of the "singing" comes from the steel superstructures as well. Perhaps some of our veteran readers can provide additional anecdotes about this phenomenon.

Q. *I have a dipole connected to my desktop shortwave receiver; recently when I attempted to attach a ground wire to the chassis, I noticed a tiny blue spark. My house wiring is modern, with a third-wire ground, and I've run an additional ground wire to two 8-ft. ground rods near my listening post. What could be wrong? (Dean Burgess, Manchester, MA)*

A. Most likely your ground rods are sufficiently distant from the power line ground to create a potential difference; this is relatively common. Do you get the same spark with the antenna disconnected, and with the radio switched off? If yes, that's probably the problem. If so, try this experiment, wearing dry gloves to avoid shock:

Temporarily connect a low-wattage (night light) bulb between the ground wire and the chassis of the radio. If it doesn't glow, there isn't enough current there to worry about. Simply connect the wire (assuming it helps reception) and forget it.

But if you want to take the diagnostics a step further, you can determine whether your electrical outlet is properly wired by obtaining an inexpensive receptacle tester with LEDs that show the proper/improper wiring status of a wall outlet. They are widely available at variety stores' electrical departments.

If you can't fine one, use a VOM (multimeter). Set the scale to read 120 VAC or higher, then stick one probe in the round hole (neutral) of the outlet, and the other in the longer of the two flat slots (common return). The lower the meter deflection, the better. If it reads 120 volts, you have wiring problems! There should, however, be 120 VAC measured between the shorter slot (hot) and either of the other holes.

There is a remote possibility of an AC leakage path in the receiver cord or power supply; this was far more common in older, tube-type radios. You can test this hypothesis two ways: First, if there is a difference in the spark between the radio being turned on or off, it's likely to be the fault of the radio.

Confirm this fault by pulling the plug out of the wall socket and testing it with the VOM on the x1K resistance scale. With the radio's power switch on, touch one prod to the round ground pin of the power cord plug, and the other prod to either of the flat pins. There should be no reading, indicating good AC isolation.

Q. *I have a 1000-foot roll of wire that has a resistance of 3-4 ohms, yet when it's coiled on a roll, I can plug it into a wall socket without blowing a 5 amp fuse. Is this an example of reactance? (Mark Burns, Terre Haute, IN)*

A. It sure is, Mark. Simplistically defined, reactance is AC resistance, and it's caused, in this case, by the inductance of that big coil as the 60Hz current oscillates back and forth through it, producing "back EMF," opposing the inrush current during each cycle. At higher frequencies like 7 MHz, a 2-ohm, 66-foot wire can appear to have a radio-frequency resistance (impedance) at its center of 50-70 ohms.

If you unwound the coil into one giant loop, the reactance would be much less, and it's far more likely to blow the fuse! But keep it bundled on the coil and use it as an effective tool demagnetizer!

Q. *I am using lightning protectors on my receiver. How do I know if one of these becomes defective? (Dave Lehy, email)*

A. That's a very good question. If there has been a storm, or if for any other reasons signals seem unusually weak, that's a good time to check. What I do from time to time is to simply remove the device from my antenna line and compare signal levels with and without it. Do this at the lowest and highest frequencies; the low frequencies are better for finding an open (broken) circuit, and the higher frequencies are better for detecting signal-absorbing losses in the system.

Keep in mind, too, that the coax can be damaged, attenuating signals. It's not a bad idea to occasionally run a new length between the antenna and the radio just as a test. It's also a good idea to replace the coax every five years or so, especially if it looks weathered. And examine the connectors occasionally for signs of corrosion.

Questions or tips sent to Ask Bob, c/o MT are printed in this column as space permits. If you desire a prompt, personal reply, mail your questions along with a self-addressed stamped envelope (no telephone calls, please) in care of MT, or e-mail to bgrove@grove-ent.com. (Please include your name and address.) The current Ask Bob is now online at our website: www.grove-ent.com

Gary Webbenhurst
ab7ni@arrl.net

40 Here is a bright idea sent in by reader Patrick Brown, WB5JHG. He purchased a Drake MS8 speaker. He wanted to convert a good speaker into a great speaker. So he did what comes naturally to a ham. He figured out how to modify it to make a better sounding speaker. Here is what he did.

He started by rounding up the necessary tools and parts: Screw driver, soldering iron, small round file, and a Radio Shack 4" full range speaker #40-1197.

Carefully open up the speaker housing. Remove the original speaker. Use the file to make the screw holes a little larger on the new RS speaker. Install the new one, re-soldering the wires (following correct polarity.) Patrick reports it is now a great sounding speaker.

You can apply Patrick's simple solution to many speaker projects. If you are new to all this, don't be afraid to try a simple experiment. There is not much to goof up. Just practice your soldering skill first on a couple pieces of wire. Most soldering irons come with a picture or two, and a paragraph of instructions to get you started.

Don't throw away that original speaker, you might need it for a future project. Remember, it did work, just not to the high standards Patrick expected. I'll bet you can find another use for it. Thanks, Patrick!

41 I love it when a reader improves on one of my bright ides. Reader John, KC6NWJ did just that. In an earlier column I had mentioned that a small 12 volt lamp could come in handy during operation in low light situations. I had several suggestions, including a new 12V lamp from RS. There were also 12V lamps from marine and RV shops, but they were way too expensive.

John found a 12-volt Tensor™ reading lamp in a thrift shop for $2. He removed the AC to 12V-wall wart and ran the wire directly to his 12-volt DC source. Naturally, he fused the new wires to his DC power source. Thanks for the idea, John.

Hmmm…I wonder what else might be lurking in the thrift store? I have previously mentioned electronic surplus parts stores; I guess I need to widen the focus. Such as, how about bookstore lamps?

42 Going on a motor vacation this summer? Whether camping or staying in a fancy resort, you can preplan and write out a list of frequencies that might be in use at your destination or while enroute. A few minutes on your favorite Internet search engine should produce some good results. If you have a programmable radio, there may be a datafile that you can download right into your scanner or ham transceiver. Try ***http://www.pro-92.com***.

43 As you enter most states, there are often visitor information offices at the first Interstate Rest Area. They give out ***free maps***. You can't beat free, and they are invaluable for some super sleuth DXing work.

Be sure to buy a couple of those cheap, disposable, one-time use cameras. You never know when you are going to drive by the emergency event of the year. To keep them cool, I seal them a freezer bag and keep them in the top of the ice chest. Several readers have advised that an empty ice chest makes a good decoy hiding place for their radios and other valuables.

Flashy new paint job for USFS Rangers

44 The summer of 2000 was an incredibly busy one for forest fires in the nation. Because many areas had little moisture this winter, they are expecting another busy summer. Get your wildfire frequencies loaded in the scanner. Last year I offered to sent out my comprehensive listing of wildland fire frequencies. About 30 people e-mailed me to get one. I asked that they email me back to confirm the frequencies and their use in their area. Not one person emailed me back. OK, this year, I will reverse the process. Send me a list of what you know for your area, and then I will send you my master list.

If you are really into monitoring wildland fires, check these websites daily:

http://www.nifc.gov/information.html
http://www.fs.fed.us/arnf/fire/fire.html
http://www.ciffc.ca/

Beside the latest scoop on fires, notice the many links from these pages. You can easily spend a day on the net just following the links. When you find good frequency info, you can click on "Save As" and download the page to your hard drive. Some of these sites give great details like repeater inputs and outputs, even PL tones. The usual caveat applies. While these URL sites were good as of my writing this article, they may change by the time you read them in June.

45 When I think of June, I think of ARRL Field Day. This is a challenge to all amateur radio operators to go out and set up temporary stations. It is intended as an emergency drill exercise. Operators are challenged to see how may contacts they can make with other amateurs in a 24-hour period under "field" operating conditions. Most local ham clubs set up an area in a nearly park, campground or other outdoor area. There can be as few as two or as many as 50 operators. They operate on HF bands, as well as VHF and UHF. They keep a running log of all the contacts them make. It is not a contest, but sure looks like most hams treat it as a contest! I urge you to participate. If you are not a ham, stop by and observe during the weekend of 23-24th.

Keep Listening!

Robert Wyman
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Scanning Your Own Backyard

Welcome to the new Scanning Report column. I wish to thank Rich Barnett for his many years of outstanding service and innovations. His shoes will be hard to fill within these pages.

I also wish to thank Rachel Baughn and Larry Van Horn for their confidence and support. While they didn't have to "twist my arm" to accept this assignment, they certainly provided much-needed training and guidance prior to this first installment.

❖ Where We're Headed

This column serves many functions within the magazine. First, it's *your* column and outlet for detailed frequency lists. Want to showcase your favorite agency or jurisdiction? Many of our readers are "connected" and have extensive personal databases. This is the place to share your data collection efforts and in-depth databases, no matter how large or small they may be.

How about special sites or special assignments? Do you work at a unique location, such as a large international airport or industrial complex? Please post your frequency lists, maps and related information so that everyone can see what you do and where you work.

Any business travelers out there? I'd especially like to hear from pilots, TV crews and government employees who travel. Those subscribers who know what "deployment" means and have a "go bag" in their vehicles will get top priority, such as the elite members of local Urban Search and Rescue (USAR), National Transportation Safety Board (NTSB), and state or federal emergency management teams.

Special events are also of interest. Every community has parades, festivals and sporting events. Some communities host professional football and baseball stadiums, professional basketball arenas, auto racing tracks, concert halls and historic sites. Guess what? They all use radios! And, *you* can listen in on most, if not all, of the behind-the-scenes action.

❖ We Take Requests

The majority of our readers are hobbyists and may not feel particularly "connected" to an interesting agency or site. Have any questions? While the magazine strives to cover electronics, antennas and trunking systems in other columns, I'll be happy to field questions about finding a site's frequencies, researching an agency's use of radios, and knowing where to look for special event communications. Don't be shy! You'll enjoy the hobby more if you can listen to the agencies, sites and events that interest you the most.

For example, the summer months bring us a variety of monitoring opportunities: local recreational events, Fourth of July celebrations, summer vacation tours and even the hurricane season. Do you know all the channels used at your stadium, concert hall, national park or tourist destination? Have you ever tried to listen?

❖ Information Management Begins at Home

All readers of *Monitoring Times* have detailed and accessible frequency lists next to their radios, right? Admit it: you're just like me. You started by listing channels on note pads. Then you decided a card file was the way to go. A brainstorm then hit: TWO cardfiles, one alphabetically by agency and one numerically by frequency. After filling out about 2,000 cards and worrying if arthritis can strike at an early age, you invested in a Personal Data Assistant (PDA) to "manage" all your information and allow for rapid searching and sorting.

142 lunch-hours later, all your data was in the PDA and life was good. Some of us even went through *several* PDAs before technology and features allowed us to back-up the information and share it with other devices. Remember names like "Wizard" and "Zaurus" and "B.O.S.S."? These were the predecessors of today's Palm and PocketPC units. All your frequency information in the…palm of your hand. Oh, did I mention computers?

Concurrent with the need to have portable radio information, many of us keep lists on our personal computers. Text files, database files, spreadsheet files and proprietary formats have all been pressed into service toward the goal of having everything in one place. Websites are the latest mechanism of organizing and sharing radio data. Do you have a better way? Any organizational tips and tricks? Is there any way to *really* get everything in one place?

❖ This Month's Focus

To start things off, let's explore a subject that is often overlooked and misunderstood: local government communications. I know you think it's boring. Who wants to listen to dog catchers and trash collectors? Actually, *you* do. If you have any interest in the subjects discussed above, then local government channels will provide another source of information and enjoyment beyond the public safety channels of police and fire agencies.

In between the radio transmissions of departments like Animal Control (the dogcatchers) and Solid Waste Disposal (the trash collectors), most cities and counties use the local government channels for departments like…

- The mayor or administrative staff of the local government jurisdiction
- Legal staff such as the public defender and the city attorney (and sometimes their investigators)
- Emergency management activities during drills and actual emergen-

cies, including "mass casualty" incidents like aircraft crashes and train wrecks; "severe weather" incidents like tornados, blizzards and hurricanes; "civil" incidents like protest marches, rallies and political events; and nuclear/chemical incidents related to power plants and industrial complexes
- Public works crews who maintain the right-of-way (and fix that pothole you complained about yesterday)
- Park and recreation departments including park rangers, beach patrols, lifeguards and tourist information booths
- Building and zoning departments that issue permits and provide inspections
- Transit agencies that run buses and commuter trains
- Engineering offices that build bridges, dredge lakes, install traffic signals and repave roads
- Scientific offices that monitor pollution, track wildlife, document historic sites and manage essential resources

Larger municipalities may also have…

- Port authorities to operate airports and seaports
- Hospital districts to coordinate ambulances, patient transportation, treatment services and facility security
- Water and sewer agencies to handle drainage, sewers, wellfields and aquaducts
- Specialized departments to regulate the unique industries or resources of a particular area

So, while police and fire frequencies may get all the attention, local government channels quietly provide vital support functions and specialized areas of expertise. In fact, many hobbyists lock out police and fire units after the initial response to a large incident, knowing that local government departments will provide interesting on-site communications.

Sometimes a local government system will even host an "unpublished" police or fire team that wishes to be totally insulated from main public safety systems. Have you ever heard an on-site worker say, "go to the other radio," and then you lost them? Did you look in the local government system for your town? I know you'll check there next time.

❖ Local Government Frequency Ranges

Local government channels are usually found in the same bands as police and fire departments. VHF-Low Band, VHF-High Band, UHF and 800 MHz all host local government systems. Water and Sewer Departments may also be located on frequencies allocated by the FCC to the "power and water" industries. Transit systems (urban commuter rail systems) may also use FCC-allocated "railroad" frequencies.

City-run hospitals, airports or special jurisdictions may be on business frequencies, licensed to a "Board of Governors" or special district. Examples include hospital districts, port authorities, water management agencies and environmental commissions.

Private contractors and concessionaires are also worth mentioning. While a local city may "own" a park, recreation area, airport, seaport or other facility, it may be managed and operated by a private company under contract to the city. Business and industrial frequencies may be licensed to the private company for this use.

Start your search for local government frequencies in the following ranges, plus any UHF-T Band (470-512 MHz) and 800 MHz trunked systems in your area. Detailed frequency information can be found in the *Police Call* series of books (edited by *MT* contributor Richard Barnett), and government agencies can be researched by name at the FCC website:
http://gullfoss2.fcc.gov/cgi-bin/ws.exe/genmen/lic_state.hts

A radio spectrum chart, with all major allocation information, is at:
http://www.ntia.doc.gov/osmhome/allochrt.html

Local Government and Related Frequencies

37.02 – 37.42	local government and police use
37.44 – 37.98	local government (highways); forestry and water industries
39.02 – 39.98	local government and police use
44.62 – 46.58	local government, police, fire, highways, conservation uses
47.02 – 48.54	local government (highways), water and other industries (47.42 is often used by local American Red Cross offices)
150.995 – 151.475	local government (highways), conservation uses
153.41 – 156.24	local government, police, fire, water, medical, industrial
158.13 – 158.265	water and power industry use
158.73 – 159.465	local government, police, fire, highways, conservation
160.215 – 161.565	railroads
451.025 – 451.6875	water, power, petroleum, forestry and other industries
452.3125 – 452.4875	railroads, trucking, taxicabs and other industries
452.7625 – 452.9625	railroads, trucking and other industries
453.0125 – 453.9875	local government, police, fire

❖ In Closing

I'm looking forward to corresponding with many of you through the e-mail address listed at the top of this column. Please send your frequency lists, article suggestions, and questions…I'll include as many as possible in future columns. See you next month!

Larry Van Horn
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U.S. NOAA Weather Radio Stations and Frequencies (conclusion)

SOUTH CAROLINA

Beaufort	WXJ23	162.475	350	Charleston
Charleston	KHB29	162.550	1000	Charleston
Columbia	WXJ20	162.400	1000	Columbia
Conway/ Myrtle Beach	KEC95	162.400	1000	Wilmington, NC
Cross	WXM93	162.475	100	Charleston
Florence	WXJ22	162.550	1000	Wilmington, NC
Greenville	WXJ21	162.550	1000	Greenville/ Spartanburg
Sumter	WWG77	162.475	10	Columbia

SOUTH DAKOTA

Aberdeen	WXM25	162.475	1000	Aberdeen
Brookings	KXI71	162.525	1000	Sioux Falls
Hot Springs	WXK64	162.425	300	Rapid City
Huron	WXM27	162.550	500	Sioux Falls
Lead	WXL23	162.525	300	Rapid City
Lowry	WXM40	162.500	1000	Aberdeen
Mitchell	WWH36	162.450	1000	Sioux Falls
Philip	KXI59	162.450	1000	Rapid City
Pickstown	KXI25	162.425	300	Sioux Falls
Pierre	WXM26	162.400	700	Aberdeen
Rapid City	WXM63	162.550	1000	Rapid City
Sioux Falls	WXM28	162.400	1000	Sioux Falls
South Shore	WXM41	162.425	1000	Aberdeen
Yankton	KXI21	162.500	1000	Sioux Falls

TENNESSEE

Bristol	WXK47	162.550	500	Knoxville/Tri Cities
Chattanooga	WXK48	162.550	1000	Knoxville/Tri Cities
Clarksville	WWH37	162.500	100	Nashville
Cookeville	WXK61	162.400	200	Nashville
Dyersburg	WWH30	162.500	1000	Memphis
Jackson	WXK60	162.550	1000	Memphis
Knoxville	WXK46	162.475	1000	Knoxville/Tri Cities
Lawrenceburg	WWF84	162.425	1000	Nashville
Memephis	WXK49	162.475	1000	Memphis
Nashville	KIG79	162.550	1000	Nashville
Shelbyville	WXK63	162.475	200	Nashville
Waverly	WXK62	162.400	1000	Nashville

TEXAS

Abilene	WXK29	162.400	1000	San Angelo
Amarillo	WXK38	162.550	1000	Amarillo
Austin	WXK27	162.400	1000	Austin/San Antonio
Bay City	WWG40	162.425	1000	Houston/Galveston
Beaumont	WXK28	162.475	1000	Lake Charles, LA
Big Spring	WXK37	162.475	1000	Midland/Odessa
Brownsville	WWG34	162.550	1000	Brownsville
Bryan/ College Station	WXK30	162.550	1000	Houston/Galveston
Corpus Christi	KHB41	162.550	100	Corpus Christi
Dallas	KEC56	162.400	1000	Dallas/ Fort Worth
Del Rio	WXJ98	162.400	1000	Austin/San Antonio
El Paso	WXK25	162.475	100	El Paso
Ft. Worth	KEC55	162.550	1000	Dallas/ Fort Worth
Galveston	KHB40	162.550	500	Houston/Galveston
Houston	KGG68	162.400	330	Houston/Galveston
Junction	WWG93	162.475	1000	San Angelo
Kerrville	WWF90	162.450	1000	Austin/San Antonio
La Grange	WWG55	162.500	1000	Austin/San Antonio
Laredo	WXK26	162.475	1000	Corpus Christi
Llano	WWF91	162.425	1000	Austin/San Antonio
Lubbock	WXK79	162.400	1000	Lubbock
Lufkin	WXK23	162.550	1000	Shreveport, LA
Odessa/Midland	WXK32	162.400	1000	Midland/Odessa
Ozona	WXL44	162.500	300	San Angelo
Paris	WXK20	162.550	1000	Dallas/ Fort Worth
Pharr	KHB33	162.400	1000	Brownsville
Port O'Conner	WXL26	162.475	100	Corpus Christi
Richland Springs	WWG94	162.525	1000	San Angelo
San Angelo	WXK33	162.550	1000	San Angelo
San Antonio	WXK67	162.550	1000	Austin/San Antonio
Sherman	WXK22	162.475	1000	Dallas/ Fort Worth
Tyler	WXK36	162.475	1000	Shreveport, LA
Victoria	WXK34	162.400	1000	Corpus Christi
Waco	WXK35	162.475	1000	Dallas/ Fort Worth
Wichita Falls	WXK31	162.475	1000	Oklahoma City, OK

UTAH

Lake Powell	WXM89	162.550	100	Salt Lake City
Logan	WXM22	162.400	100	Salt Lake City
Milford/ Cedar City	WXM24	162.400	100	Salt Lake City
Salt Lake City	KEC78	162.550	330	Salt Lake City
St. George (Utah Hill)	WWF51	162.425	100	Salt Lake City
Tooele (South Mtn)	WWF46	162.450	100	Salt Lake City
Tooele (Vernon Hills)	WWF47	162.525	100	Salt Lake City
Vernal	WXM23	162.400	100	Grand Junction, CO
Wendover	KXI30	162.475	100	Salt Lake City

VIRGINIA

Heathsville	WXM57	162.400	1000	Wakefield
Lynchburg	WXL92	162.550	1000	Roanoke
Norfolk	KHB37	162.550	1000	Wakefield
Richmond	WXK65	162.475	1000	Wakefield
Roanoke	WXL60	162.475	1000	Roanoke
Washington, DC (Manassas)	KHB36	162.550	1000	Baltimore/Washington

VIRGIN ISLANDS

St. Thomas	WXM96	162.475	500	San Juan

VERMONT

Burlington	KIG60	162.400	1000	Burlington
Marlboro	WXM68	162.425	300	Albany
Windsor	WXM44	162.475	400	Burlington

WASHINGTON

Mt. Octopus	KXI27	162.425	300	Seattle/Tacoma
Neah Bay	KIH36	162.550	330	Seattle/Tacoma
Okanagan (Tunk Mtn)	WWF49	162.525	50	Spokane
Olympia	WXM62	162.475	100	Seattle/Tacoma
Plymouth	WWH27	162.425	100	Pendleton, OR
Puget Sound (Pt. Angeles) Marine	WWG24	162.425	100	Seattle/Tacoma
Richland	WWF56	162.450	100	Pendleton, OR
Seattle	KHB60	162.550	330	Seattle/Tacoma
Spokane	WXL86	162.400	100	Spokane
Wenatchee	WXM48	162.475	100	Spokane
Yakima	KIG75	162.550	300	Pendleton, OR

WISCONSIN

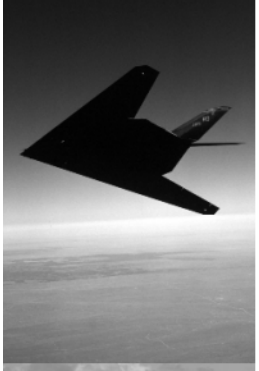
Adams	WWF40	162.400	300	La Crosse
Crandon	WWG86	162.450	800	Green Bay
Fond du Lac	WWG87	162.500	1000	Milwaukee
Green Bay	KIG65	162.550	1000	Green Bay
Janesville	WWG89	162.425	200	Milwaukee
La Crosse	WXJ86	162.550	1000	La Crosse
Madison	WXJ87	162.550	1000	Milwaukee
Menomonie	WXJ88	162.400	1000	Minneapolis, MN
Milwaukee	KEC60	162.400	1000	Milwaukee
Park Falls	WXM91	162.500	500	Duluth, MN
Prairie du Chien	WWG86	162.500	300	La Crosse
Richland Center	WWG90	162.450	200	La Crosse
Shenoygan	WWG91	162.525	200	Milwaukee
Sister Bay	WXN69	162.425	500	Green Bay
Wausau	WXJ89	162.475	1000	Green Bay

WEST VIRGINIA

Beckley	WXM71	162.550	400	Charleston
Charleston	WXJ84	162.400	1000	Charleston
Clarksburg	WXJ85	162.550	1000	Charleston
Gilbert	WXM75	162.475	100	Charleston
Hinton	WXM72	162.425	1000	Roanoke, VA
Moorefield	WXM73	162.400	1000	Baltimore/Washington
Spencer	WXM70	162.500	500	Charleston
Sutton	WXM74	162.450	1000	Charleston

WYOMING

Casper Mtn	WXM47	162.400	400	Riverton
Cheyenne	WXM37	162.550	1000	Cheyenne
Evanston	KXI85	162.450	300	Salt Lake City, UT
Lander	WXM61	162.475	1000	Riverton
Rawlins	KXI37	162.425	300	Cheyenne
Rock Springs	KXI34	162.550	300	Riverton
Sheridan	WXM46	162.475	400	Billings, MT



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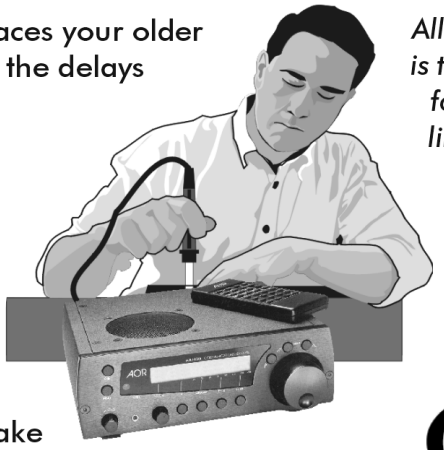

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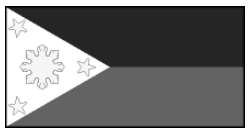
Philippine News on Shortwave Utility

There are over 7100 islands in the Philippines. Their population is diverse, with many religious and class rivalries. Philippine politics are highly contentious, sometimes dangerous, and rarely boring.



All of this guarantees that many Filipinos are news junkies. If standard media fail, the people do it themselves. They simply take to the air, legally or otherwise, and relay the day's stories. Needless to say, utility radios are often enlisted to reach Filipino sailors and emigrants worldwide on HF (high frequency, or "short wave").

For example, last January's "People Power" impeachment spawned several impromptu, maritime news nets. Listeners worldwide were perplexed by some of the strangest utility chatter in a long time.

The largest and best group still meets fairly consistently on 8272 kilohertz (kHz) upper sideband (USB). Its scope is worldwide, but most stations are in the Pacific, Gulf of Mexico, and Caribbean. That's a lot of ocean.

You'll know this net when you hear it. About half the chatter is in various dialects of English. Most of the rest is Tagalog, also called Pilipino, a regional language now considered official and taught in Philippine schools. This still, however, leaves quite a bit of pidgin conversation that utterly stumps native speakers of either language.

This group maintains a pretty good net discipline, but without many procedures. The only standard one seems to be "break-break," when new stations want to check in. A few operators use "cambio," the Spanish for "over." The control station of the day, or the hour, reads news bulletins on request. These are usually ripped, by permission or otherwise, from the wires of PNA, the Philippines News Agency. PNA's terse little dispatches will nearly always be in English. As new people appear, the net will repeat them. And so it goes, all through the night.

Another frequency recently logged for this kind of activity is 8727 kHz USB. Like 8272, it's an impromptu splinter channel. When solar activity drops off, they'll probably return to frequencies around 6502 kHz USB.

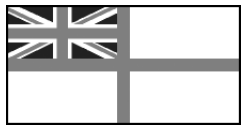
The identical PNA bulletins are sporadically broadcast, in English, on 16-megahertz maritime frequencies using SITOR-B. SITOR is Simplex Telex Over Radio, an improved form of RTTY, and mode B is forward error correction, a broadcast format also used for weather and navigation warnings. Few of these news broadcasts are authorized by any of the usual people, nor are they on very many "official" channel frequencies.

Look for these funky relays on frequencies like 16540, 16787, 16789.5, 16791.5, 16793, 16796, 16797.5, 16800, 16801, and 16803 kHz, just to note the dial positions of a few recent hits. Some of these might just be different receiver offsets of the same channel centers. To make sure, just tune the whole 16 and 18 megahertz direct-printing maritime allocations for any SITOR-B that is obviously not the weather. These impromptu broadcasts are usually completely unidentified, though a recent one was signed, "SHARED TO YOU BY (((NAGUILIAN BOY))).

These relays are fun, and also a good source of real news that rarely gets reported anyplace else. I wish you good hunting for this great stuff.

❖ Bracknell FAX Closes

In late March, the British National Meteorological Centre announced that, at 1200 UTC on April third, all high-frequency (HF) weather facsimile services from GFA, Bracknell, would end. In order to fill the resulting gap, the Royal Navy began testing an expanded FAX service at GYA, from its own Fleet Weather and Oceanography Centre in Northwood.



Bracknell broadcast its last chart, with no ceremony whatsoever, at 1055 UTC. All frequencies briefly went dark, then Northwood came up on 2618.5, 4610, 8040, and 11086.5 kHz. Of course, we tune these in upper sideband (USB), 1.9 Hz lower, with settings of 120/576.

Northwood's schedule is continuous on all frequencies, though not every hourly start uses the full 60 minutes. A detailed schedule has been posted to the Utility World web site, at ***http://www.ominous-valve.com/uteworld.html***.

❖ More Radar Interference

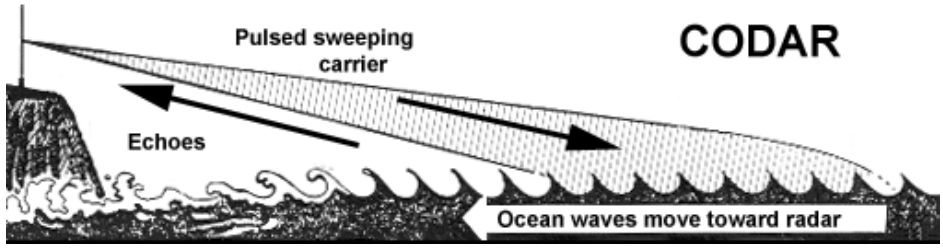
The problem of HF surface radar just won't go away. This 20-year-old technology has matured, and it's being deployed worldwide for commercial and military uses. You've probably heard its loudest version, called CODAR, for Coastal Ocean Dynamics Applications Radar. It makes a distinctive boinging sound once or twice per second, across a wide frequency range.

CODAR works by illuminating coastal waters with ground waves from two separated, vertical antennas fed by small transmitters. At the receiver, a computer creates a real-time map of currents. These maps are used for research, wave mapping, or even possible oil spill containment.

CODAR's pulsed carrier sweeps downward over a range from 25 to 150 kHz, as determined by resolution and coverage area. Frequencies are 11.5 to 14 megahertz (MHz) "low band," and 24 to 27 MHz "mid band." A long-range version hangs out around 4.5 to 5.5 MHz, though it's been heard lower.

The boinging sound is caused by your radio being set to USB, and in fact it reverses to an upward "bwing" if you switch to lower sideband. Tuning across the sweep range makes the twanging slower if you're going down, and faster if moving up. It's all high-school physics, but still strange to hear. Everything's fine until the signals and their often prolific harmonics go places where they're not welcome. For example, a CODAR heard all over North America from 24890 to 24990 kHz was recently busted by hams and traced to a new site in Honduras. Its operators had set up on the wrong frequency. And so ended this particular nuisance, but not the greater problem.

I trust it'll all get sorted out. See you next month.



Utility World

Utility Logs

Hugh Stegman
utilityworld@ominous-valve.com
www.ominous-valve.com/uteworld.html

ABBREVIATIONS USED IN THIS COLUMN

AFB	Air Force Base
ALE	Automatic Link Establishment
AM	Amplitude Modulation
ARQ	Synchronous transmission and automatic repetition teleprinting system
CAMSLANT	Communication Area Master Station, Atlantic
CW	Continuous Wave (Morse telegraphy)
DX	Distant station reception
EAM	Emergency Action Message
E10	Israeli Phonetic "numbers" Station
E10a	Israeli Phonetic Station, null message format
FAX	Radio facsimile
FEC	Forward Error Correction teleprinting system
FEMA	Federal Emergency Management Agency
FGS	Federal German Ship
GANTSEC	Greater Antilles Section
GHFS	Global High Frequency System
LDOC	Long Distance Operational Control
M8a	Cuban CW, ANDUWRIGMT for 1-0, 3 messages
Meteo	Meteorological
MFA	Ministry of Foreign Affairs
NGB	National Guard Bureau
RATT	Radioteletype
RSA	Republic of South Africa
RTTY	Radioteletype
SITOR-A	Simplex Telex Over Radio, ARQ mode
SITOR-B	Simplex Telex Over Radio, FEC mode
UK	United Kingdom
Unid	Unidentified
US	United States
V13	New Star Radio; Taiwanese "numbers"
V2	Cuban Spanish "numbers" starting "Atencion!"
VOLMET	Flight Weather broadcasts

All transmissions are USB (upper sideband) unless otherwise indicated. All frequencies are in kHz (kilohertz) and all times are UTC (Coordinated Universal Time). "Numbers" stations (encrypted, usually unidentified, broadcasts thought to be intelligence-related) are identified in () with their ENIGMA station designators, as issued by the European Numbers Intelligence Gathering and Monitoring Association.

490.0 "E"-Corsen Radio, with bulletin referring to a distressed vessel, in SITOR-B, at 2040. (Day Watson-UK)

3137.0 160018-US Air Force aircraft, calling ADW (Andrews AFB), in ALE at 2236. (Ary Boender-Netherlands)

3280.5 GYA-British Royal Navy, Northwood, UK, testing FAX equipment at 2246. (Watson-UK)

3485.0 Gander Radio, Canada, with VOLMET for Winnipeg, Edmonton, Calgary, and Churchill, at 2224. (Dean Burgess-MA)

4028.0 Cuban "Atencion" voice "numbers" in AM (V2), with weak CW "numbers" (M8) down below in the audio, at 0503. (Tom Sevart-KS) *[Further evidence they both use the same facilities –Hugh]*

4154.0 DRAO-German Navy frigate FGS *Luebeck*, calling DHJ 59 (German Navy, Wilhelmshaven), part of a joint Caribbean exercise, voice and RTTY at 1440. (Ron Perron-MD)

4305.1 GYA- British Royal Navy, Northwood, UK, sending the new FAX schedule, 120/576, at 1530. (Watson-UK)

4372.0 Giant Killer-US Navy Fleet Area Control and Surveillance Facility, VA, at 0641. (Sevart-KS)

4610.0 GFA-Bracknell Meteo, UK, with its last FAX weather chart ever, at 1055. GYA-Royal Navy, Northwood, UK, with its first FAX chart of the new replacement service, also on 2618.5, 8040, and 11086.5, at 1125. (Watson-UK)

4620.0 Several US Navy stations with single-letter identifiers, coordinating "alligator" link-11 tracking at 0538. (Sevart-KS)

4739.0 Swordfish 70-Unknown US military, setting up "RATT" (military RTTY) with High Voltage, at 0148 and 0239. (Perron-MD)

5103.0 A25-Latvian military, calling PAMATS in ALE, at 1948. (Boender-Netherlands)

5108.0 Moscow Meteo, Russia, with FAX charts, also on 6890, at 1538. (Boender-Netherlands)

5277.0 Panther-US Drug Enforcement Agency, Bahamas, taking encoded position report from Coast Guard 32C, at 0021. (Perron-MD)

5339.5 GANTSEC-US Coast Guard Greater Antilles Section, Puerto Rico, working aircraft Stingray 20, giving 8983 kHz as secondary, at 0001. (Perron-MD)

5343.0 TA3U- Lithuanian military calling TE3L in ALE at 1734. KL3R, calling TE3L in ALE at 1800. (Boender-Netherlands)

5418.0 Cuban "Atencion" AM numbers (V2), at 0302. (Camillo Castillo-Panama)

5574.0 San Francisco Radio, CA, giving weather to an unknown aircraft in the Central/East Pacific air route control net, at 0245. (Larry McDermott-CA)

5696.0 CAMSLANT-US Coast Guard, VA, working Stingray 31 at 0557. (Mid-Atlantic DXer-MD)

5841.0 Coast Guard 61A-US Coast Guard, passing an encoded position report to Panther, at 0343. (Perron-MD)

5882.0 YRR3-Bucharest Meteo, with coded weather observations in 50-baud RTTY. (De Berti Paolo-Switzerland)

6712.0 Andrews-US Air Force GHFS control at Andrews AFB, MD, with a 28-character EAM simulcast on 4724, 6739, and 8992, at 0228. (Burgess-MA)

6730.0 VLB2-Israeli intelligence (E10a), repeating a phonetic callup in a female English speaking voice, no message, at 0217. (Burgess-MA)

6739.0 McClellan-US Air Force, CA, with a 22 character EAM, at 0813. (Brent Davenport-CO)

6768.0 Cuban CW "Cut" numbers station, 3-message format (M8a), at 1302. (Castillo-Panama)

6795.0 Cuban CW "Cut" numbers (M8a), twice at 1301. (Castillo-Panama)

6797.0 Cuban CW "Cut" numbers (M8a), 5 times at 1201, once at 1302. (Castillo-Panama)

6824.0 Cuban CW "Cut" numbers (M8a), at 1202 and 1303. (Castillo-Panama)

6912.0 Unid-Usually the Israeli Phonetic Station (E10), but this time only transmitter tests and counts from a male voice in a Middle Eastern language, at 0315. (John Maky-AR)

6933.0 Cuban CW "Cut" numbers (M8a), at 1201 and 1302. (Castillo-Panama)

6978.5 B01-Possible Norwegian military, passing ALE network commands to MP2, MP3, MP5, MP7, and MP, every six minutes beginning at 1638. (Watson-UK)

7605.0 KPA2-Israeli intelligence (E10a), with repeated phonetic callup, no message, at 0218. (Burgess-MA)

7650.0 SYASIX-Unid station with ALE test message for SYCSIX, at 0839. (Watson-UK)

7889.0 Cuban CW "Cut" numbers 3-message format (M8a), at 1200 and 1300. (Castillo-Panama)

8007.0 BASE 0-Turkish military, sounding in ALE at 1749. BASE 1, sounding at 1759 and 2025, BASE 4 at 1854 and 1951, and BASE9 at 2058. (Boender-Netherlands)

8125.0 KIT 88-US Federal Aviation Agency, VA, calling roll in the East Coast net, at 1545. (Larry Van Horn-NC)

8300.0 New Star-Chinese female 4-figure "numbers" voice (V13), in AM, at 1430. (Sevart-KS)

8723.4 Unid-British Royal Navy, probably Northwood, with FAX test charts, 120/576, at 1230. (Watson-UK)

8764.0 CAMSLANT Chesapeake-US Coast Guard, Atlantic Master Station, with weather at 2200. (McDermott-CA)

8788.0 Gdynia Radio-Egyptian maritime coastal station, making phone patches from SUDW (Egyptian vessel *Abu Egila*), and 9HHF5 (Maltese vessel *Astypalea*), in Arabic, at 0108. (Perron-MD)

8906.0 New York-North Atlantic air control, working Canadian 3101 at 0846. (Sevart-KS)

8983.0 Rescue 2131-US Coast Guard aircraft working CAMSLANT Chesapeake in a rescue operation, updating its status at 2137 and 2200. (Burgess-MA) CAMSLANT, working Coast Guard Rescue 2140, aiding a distressed go-fast boat at 2143. (Perron-MD)

8992.0 Thule-US Air Force, Greenland, with a 22-character EAM at 0817. Puerto Rico, with a 28-character EAM at 0821, then repeating the 22-character one at 0822. (Davenport-CO)

9016.0 Art Show-US military, in an hourly signal check with Amperage, at 0239. (Jeff Haverlah-TX)
9033.0 Big League-US Marine Corps exercise in southern California, working Fleet Hospital, Revolution, and Mother Lode, mostly concerning mock casualties, at 0642. (Haverlah-TX)
9130.0 EZI-Israeli intelligence "numbers" (E10), in progress at 0238, then repeated the message for "80" at 0247, and one for "15" at 0301. (Gary Cohen-MA)
9142.0 Unid-English male "numbers" voice, with 5-digit groups in AM, ended with "783 783 166 166 00000"at 0233. (Cohen-MA)
9145.0 854194-ALE address identification for a US Army aircraft sounding along with CLS at Fort Campbell, KY at 1804. (Van Horn-NC)
9270.0 CIO2-Israeli intelligence "numbers" (E10a), repeating callup only, at 0251. (Cohen-MA)
9320.0 Andrews-US Air Force, MD, came from 8992, working Tin Roof in voice and data at 0612. (Haverlah-TX)
10206.0 DHJ 58-German Navy, Glucksburg, working DRAR (frigate FGS *Niedersachsen*) and DRKH (auxiliary ship FGS *Meersburg*), part of a joint Caribbean exercise, at 0222. (Perron-MD)
10493.7 RFTJF-French Forces, Port Bouet, working RFTJ, Dakar, Senegal, in ARQ. (Paolo-Switzerland)
10690.0 NGB55-US National Guard, Austin, TX, working NGB42 in ALE and voice, at 2034. (Sevart-KS)
10917.7 RFTJ-French Forces, Dakar, with text in ARQ. (Paolo-Switzerland)
11000.0 RIW-Russian Navy, active all day with CW messages to RKZ, starting at 1800. (Geoff Halligey-UK)
11175.0 Reach 191-US Air Force Air Mobility Command transport, patching Hilda East via Puerto Rico, at 0142. Gold 66-US Air Force, in a patch to Hilda West via Hickam, at 0802. (McDermott-CA) Reach 7027, calling Mainsail at 0459. SAM 204-US Air Force Special Air Mission, calling Mainsail at 0506. (Davenport-CO) Shark 67-US military, in a patch via Puerto Rico to Smasher (Flight Monitoring Facility, Key West, FL), reported previous failed attempts to make contact on 4455, 7935, 11205, 14383, and 20943, at 1324. (Perron-MD) 999NHQCAP-US Civil Air Patrol, sounding in ALE, not authorized for this channel, at 1559. (Van Horn-NC)
11178.0 Hunter 01-Probably British Royal Air Force, working PJK, Dutch Navy, Curacao, discussing RATT on another frequency at 0438. (MADX-MD)
11226.0 PLA-US Air Force, Lajes Field, Azores Islands, working MCC (McClellan/West Coast, CA) in ALE and voice, at 0711. (Sevart-KS)
11247.0 Navy 700-British Royal Navy aircraft, calling Haven (Ascension Island), no joy at 1554. (Perron-MD)
11336.0 Gander Radio, Canada, getting positions from scheduled flights Iberia 9603, Lima 2297, Shamrock 107, Virgin 126, and Air France 346, telling most to change to 8831 when reaching 50 degrees west, at 1940. (Burgess-MA)
11492.0 6137-Moroccan Army, sounding in ALE at 1802. (Boender-Netherlands)
12412.5 NOJ-US Coast Guard, Kodiak, AK, with a noisy Fax weather chart, 120/576, at 1011, signal faded at 1028. (Watson-UK)
13110.0 WLO-Mobile Radio, AL, with a voice synthesized traffic list, at 1806. (Sevart-KS)
13200.0 Offutt-US Air Force GHFS, Offutt AFB, NE, with a 22-character EAM, at 1920. (Burgess-MA)
13282.0 Honolulu VOLMET, with Pacific flying weather at 1300. (McDermott-CA)
13315.0 Unid-Aeronautical Radio, Inc. High-Frequency Data Link, Santa Cruz, CA, with data bursts at 2240. (Watson-UK)
13348.0 Cedar Rapids Radio-Rockwell/Collins LDOC, Iowa, patching Northwest 69 (inaudible) to Dispatch for an inflight medical emergency, suggested flight crew contact the Mayo Clinic, at 0233. (Perron-MD)
13446.0 WGY 908-FEMA Region 8, CO, working WGY 925, WI, at 1535. (Sevart-KS)
13886.0 Moscow Meteo, Russia, with FAX weather charts at 1056. (Boender-Netherlands)
13907.0 Service Center-US military, with scanning databursts, then calling "1-4-Juliet" in voice, at 2047. (Haverlah-TX)
13968.5 A25-Latvian military, calling OZOLS in ALE at 1838. (Boender-Netherlands)
14718.3 RFHI-French Forces, Noumea, with a control message in ARQ. (Paolo-Switzerland)
14776.0 WGY 904-FEMA Region 4, GA, in a comm check with WGY 912, Special Facility, VA, in voice and then 850/75 RTTY, at 1459. (Sevart-KS)
14902.0 Mockingbird 11-US Civil Air Patrol, with a general net call at 1532. (Sevart-KS)
15016.0 Guam-US Air Force GHFS, with a coded message "for OS359," at 0518, again at 0614, 0703, and 0756. Andrews, with SKYKING broadcasts at 0530 and 0604. (McDermott-CA)
15025.0 Shark 80-Probable US Navy, calling Smasher, FL, then working Shark 85, at 1307. (Perron-MD)
15043.0 AED-US Air Force, Elmendorf AFB, AK, calling MCC, McClellan/West Coast, CA, at 1743. (Boender-Netherlands)
15867.0 Stingray 31-US Coast Guard, getting their crypto re-keyed over the air from Service Center (US Customs, Oklahoma City, OK), at 1426. (Perron-MD)
15929.0 DRAU-German Navy frigate FGS *Koeln*, calling DHJ 59, German Navy, Wilhelmshaven, part of a joint Caribbean exercise, at 1440. (Perron-MD)
16000.0 VNG-Australian standard time pips with spoken announcement, at 0853. (Watson-UK) Unid-Weak time pips, probably VNG, at 2030 (Burgess-MA)
16026.9 BAF9-Beijing, China, with a grainy FAX weather chart, 120/576 at 0900. (Watson-UK)
16035.0 9VG252-Kyodo News, Singapore, with a Japanese newspaper FAX, 60/576, at 0914. (Watson-UK)
16324.7 Unid-Probably RFTJD, French Forces, Libreville, with ARQ clear text in French, at 1937. (MADX-MD)
16412.7 Unid-Kinshasa, Congo, bank traffic in 200/200 Pactor, at 1240. (Bob Hall-RSA)
16685.5 ZENC-Probable British vessel, working a coast station in SITOR-A at 1724. (MADX-MD)
16971.0 JJC-Tokyo Radio, Japan, with a Kyodo News Japanese newspaper, 60/576, at 0745. (Watson-UK)
17069.6 JJC-Tokyo Radio, Japan, with Sumo wrestling reports, 60/576, at 1110. (Watson-UK)
17164.0 Unid-Odd dripping sound, turned out to be CLA, Cuba, with CW transmitter problems at 2356. (Sevart-KS)
17175.2 UFL-Vladivostok Radio, Russia, with FEC maritime information at 2339. (MADX-MD)
17248.0 Cyprus Radio, with a repeating voice loop at 1818. (Sevart-KS)
17314.0 SPO81-Szczecin Radio, female passing what sounded like currency rates, at 1950. (MADX-MD)
17420.0 ZPYM-Taiwanese Navy, sounding in ALE, at 1448. IHOE, calling GUPY in ALE, at 1822. (Watson-UK)
18220.0 JMH5-Tokyo Meteo, with a weak FAX weather chart at 1650. (MADX-MD)
20631.0 PLA-US Air Force, Lajes, in ALE and voice checks with ADW (Andrews) and MCC (McClellan/West Coast), at 2156. (MADX-MD)
21865.0 Unid-Possibly Polish MFA, Warsaw, with a long religious epistle in English, then ARQ messages in Polish at 1223. (MADX-MD)
22542.0 JJC-Tokyo Radio, with a Japanese newspaper FAX, 60/576, at 0720. (Boender-Netherlands)
23214.0 Unknown-Probably US Customs, in secure voice at 1709. (Perron-MD)
23370.0 HZN50-Jeddah, Saudi Arabia, with RTTY weather (850/100R), at 1400. (Watson-UK)
23522.9 JMH-Tokyo Meteo, Japan, with weather FAX at 0850. (Boender-Netherlands)
23526.0 S73-Swedish MFA, Lagos, Nigeria, sounding in ALE at 1612. S00-Swedish MFA, Stockholm, working S73 in ALE and phase-shift keying at 1614. (Watson-UK)
24332.0 GXQ-Royal Navy, London, identifying twice in 6-tone Piccolo, at 1435. (Watson-UK)
26105.0 KEJ-Globe Wireless, Hawaii, identifying in CW between SITOR-A and GlobeData sync bursts, at 0040. (Hugh Stegman-CA)
26241.7 RFVIE-French Forces, Le Port, working RFFKA, Brest, in coded ARQ, at 0611. (MADX-MD)
27870.0 JDG-US Air Force, Diego Garcia, sounding in ALE at 1750. (Boender-Netherlands)

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The Bulgarian Diplomatic Service

This month finds us on a "monitoring mission" to the natural paradise of Costa Rica, from where this column is being written.

As you can see from the picture below, the view from the laptop is stunning – coconut palms, the brown pelicans surfing the Pacific rollers, and the deep blue tropical sky. Anyway, on to the ether, and a mixed bag this month as we profile the Bulgarian Diplomatic Service, and update you on a few more ALE networks.

A once busy network, MFA Sofia seems to have scaled down operations somewhat over the past years, but remains a common occupant of the HF spectrum. Since 1997, the Bulgarians have settled on a proprietary, full-duplex ASCII-based ARQ system (ASCII-ARQ or IRA-ARQ) for the majority of its traffic. Call-ups and operator chatter, however, are still sent using regular 75bd Baudot RTTY with the characteristic Eastern-Bloc 500Hz shift. The operators use a distinctive Q and Z code to communicate various information, as follows:

ZAP1 ZAP2 ZAP3	Please acknowledge
ur ZAL normal	Are you on your normal frequency?
my ZAL 16015	My frequency is 16015kHz
QAP my ZAL?	Do you hear me on my frequency?
ZAR xxx	Use xxx baud speed
ZOHx	I have x messages for you
ZOK	Receiving you OK
ZNN	I have nothing further for you
ZRR xxx	Use xxx baud speed

ASCII-ARQ appears to be able to shift speeds dynamically and has been heard at 75, 100, 120, 150, 160, 180, 192, 210.33, 240, 270.44, 272.74, 300, 600, 800 and 1200bd with shifts between 500 and 1200Hz. This system always shows an autocorrelation of 11, likely due to a structure of 1 start bit, 7 data bits (the ASCII character), 1 parity, and two stop bits. Although most of the traffic carried on this system appears to be encoded, one can find plain-text indicating locations, file names and other snippets. Just use the ASCII module in your decoder, and set to the correct speed and shift to see this.

Embassies are called by the MFA using three letter tactical callsigns – for example "CIL CIL CIL ryryryryryryry." See the resources section for a link to a list of the known embassy codes. Rarely, stations will use actual ITU callsigns in the LZ series.

Like most of the established diplomatic services, the Bulgarians have used a large pool of frequencies. Here is a recently heard selection (note the commonly used offset of 0.3kHz):

3864 5195 5825 8065.3 8070 8099.5 8162 9055 9276 10154 10158 10159 10256 11054 11064 11146.7 11163 11164 11684 12114 12124 12134.3 12137.4 12138.3 12190 12190.3 12217 12218 13426.3 13438 13924 13928.7 13933.3 13938 14376 14377 14387 14388 14397 14405 14774.7 14779.3 14830.3 14855.3 14894.3 16015.7 16017.7 16030 16036 16105 16207 17421 17422 18045 18050 19060.3 19160 19365.3 20040 20360 20362.3

Here's the start of a typical unencrypted message:

za informaciy nr 01034 dumi 1651
prodwljenie na svetoven pregled
moskva. pod zaglavie +centralna aziy: twrsene na partn(or?+
v. +moskovskie novosti20tt 28.2. publikuva material na s.solodovnik, vode& nauqen swtrudnik na moskovskiy dwrjaven institut za mejdunarodni otnoxeniy pri mvnr na rusiy. avtorwt ocenyva pose&enieto na e.primakov v taxkent kato +proval+ i konstatira, qe uzbekistan e proyvil minimalen interes sprymo predlojeniyta na rusiy po tadjikistan i afganistan, a poziciyta

And this is a typical header for encrypted text:

za tripoli nr 00257/56142 gr 101 ekstrena [to Tripoli]
ddddddddddddddddddddddddddddddoxzo [distinctive run-in]
iwhbwajjhumicxio u
xrmnvoygcevrtw%?-%22% uesvcyqrxll3@4%)-&'17)3&
qaxb
ok tks znn zap 1 ok r tks zap 1 gb sk@@ [typical closedown]

ALE Networks Update

Thanks to a few live recordings of their pilots breathing heavily through their masks, the "BB1" network can now be confirmed as Israeli Air Force.

The "X7, A5" network may in fact be Algerian in origin, and not Moroccan as previously reported.

Some concentrated effort on the "VFO, TAC" network and some interesting AMD operator chatter confirmed that this is a Spanish speaking operation, and other information received suggests that this could be the Venezuelan Navy.

The net operates on the following frequencies (all LSB):

6845, 6847, 8080, 10155, 11429, 12103, 17466 & 20400 kHz

The most common identifiers in this net are: 23F, 3RO, ASI, BRE, BUR, CA2, CAS, COS, DCC, LIO, OFM, PPZ, TAC & VFO

The Ethiopean Telecomms Administration appears to running a net on 7930 kHz (USB and LSB) with ALE triggering the Racal MSM-1250 and Racal HSM mode. Sometimes the ALE is being used to initiate phone calls. The identifiers are:

ADS	Addis Abeba?
AN1	UNID
DM1	Debre Markos 1
DM2	Debre Markos 2
KLA	UNID
OMO	North or South Omo
SHO	Shoa (Shewa)
TYA	Tigray

There is another North African network present on the following frequencies: 7635 and 11202 kHz. The identifiers are:

ATE
ATEF
BAD
BADIS
BADCAD BAD
MALEK
MALEK MIM
VIO

Another new unidentified net was discovered on 5523 kHz USB, and features the following identifiers: 123, ARGON1, F6, H1, H2, H3, H4, S, T

Any further identifiers or other information on these networks are gratefully received.

And a quick note to add: The latest version of Charles Brain's PC-ALE software now adds a "record" feature. An ALE call triggering voice or modem activity can be automatically recorded for a user-definable amount of time. This is useful in tying down the users of unidentified networks or in recording phone patches and other activity on well-known networks.

On a more curious note, a number of readers have recently emailed us with the same question: they purchased the latest *Klingenfuss Utility Guide* and were wondering why the esteemed publication is devoid of ALE loggings. We're not sure of the reason why, either. Stay tuned!

That's it for this month. Enjoy the 1s and 0s.

Resources

Bulgarian Diplomatic Service:
http://www.mindspring.com/~mike.chace/mfatext/Bulgaria.txt
PC-ALE:
http://www.chbrain.dircon.co.uk/pcale.html

Glenn Hauser
P.O. Box 1684-MT, Enid, OK 73702
wghauser@yahoo.com
www.angelfire.com/ok/worldofradio

Listen for the Buzz of Digital Shortwave

For the current A-01 season, Radio Nederland's schedule shows a Bonaire 50 kW transmitter with Digital Radio Mondiale tests Monday-Friday, languages not specified, azimuths:

0530-0625	11655	50	WEu
0630-0755	15245	50	WEu
1730-1925	17880	350	ENAm
1930-2025	17880	80	WEu
2030-2125	15455	350	ENAm

Test programs are produced in Hilversum. DRM is preparing its own QSL card. Andy Sennitt of *Media Network*: Jan-Peter Werkman, my RN colleague who arranges the DRM tests, says it is designed to simulate as accurately as possible typical program content, i.e. quiet and loud passages of music of various types, to test reliability of the DRM technology on specific circuits over a whole broadcast period. Various characteristics of the signal have to be measured and recorded.

This had not yet started by mid-April. But beware of the digital buzz. Listeners may gauge how bad DRM interference will be. Between 1900 and 2000 check if it bothers RCI Sackville in English to Europe on 17870, 10 kHz from 17880, suggests Ricky Leong in Québec.

Chuck Ermatinger opines in *DX Listening Digest*: I'm extremely down about the insistence of DRM that digital shortwave should completely replace AM mode broadcasts. Who are they to tell the world the way it will be? Millions of receivers to become obsolete? Sounds like another industry scheme to attempt to make money while telling us what we need. How many listeners will be cut off from international reception due to lack of access to the internet and digital-capable receivers? Surely it must be a huge number. A well-managed AM-mode HF spectrum would benefit many more people than a spectrum awash in digital noise!

ALASKA KNLS, English on 11870 at 1300-1400 not audible here, probably entire A-01 season, due to another religious station. Too bad, because I enjoyed KNLS with nice music, historical segments about the US (Lee Silvi, Mentor OH) Problem is KNLS ensconcing itself in the super-splatter skirts of M. Angelica, WEWN 11875. Lower 48 not its target area, anyway (gh)

ANGOLA [non] A DTK-Germany schedule effective April 15 showed R. Ecclésia relays daily at 0500-0600, 1700-1800 on 15775, 160 degrees, but it was not yet heard for the next few days. RE, prevented by the MPLA government from effective coverage inside the country, tried relays via R. Nederland briefly last year (gh) See **http://ecclesia.snet.co.ao** (Hans Johnson, *Cumbre DX*)

ANTARCTICA LRA 36, Radio Nacional Arcángel San Gabriel, back on air at 1945 on 15475.56, drifting a bit, 2003 ID (Guido Schotmans, Belgium, *hard-core-dx*) [non] If you hear Spanish on 15476 later, better not assume it's LRA36. We found a weak spur from R. Martí's super-strong Delano 15330 at 0115, but on the air 2200-0300 (gh, OK)

AUSTRALIA From late March until mid-April, Alice Springs stayed on 4835 24 hours, instead of 2310 at night. Should make it better abroad that way (Chris Hambly, Victoria, *DX Listening Digest*)

R. Australia planned this usage via Cox Peninsula / Darwin 250 kW, azimuths:

13605 1100-1230 340 Chinese
15240 2200-2300 340 Chinese
15240 2300-2400 317 Khmer
15425 2130-2400 290 Indonesian

And Christian Voice, all English, 250 kW, azimuths:

9715 1700-2100 340
11815 1700-1900 303
13730 1400-1700 340
13775 1000-1400 340
15400 1200-1700 303
17710 0700-1000 340
17730 1000-1200 303 (via Wolfgang Büschel, *DXLD*)

AUSTRIA Starting in mid-April on 7235 via Austria at 2030-2130, Sat, Sun, Mon and Tue only is Everest Media Services. To be heard all over UK, Ireland and beyond. More info shows this is for Nepalis in Britain: **http://listen.to/everestradio** (Peter Ungerböck, Austria, A-DX via Wolfgang Büschel)

BELARUS' R. Belarus' International, 7210, UT Sun 0159-0222, IS and English, but poor signal and low audio (Jim Evans, TN, *Cumbre DX*)

BELGIUM *Radio World* is now available as an ondemand audio file via **http://www.rvi.be** (Frans Vossen, RVi) The RVi printed A-01 program schedule shows we are now supposed to abbr. it capital R, capital V, small i (gh)

BRAZIL The Rádio Roraima website **http://www.radiororaima.com.br** has a lot of info on the station, its history and programming, and this schedule on 4875: M-F 0600-0335; Sat 0700-0455; Sun 0800-0325 (Samuel Cássio Martins, *@-tividade DX*)

Director of Rádio Difusora de Limeira, Bruno Bortolan, says reception reports to bab@terra.com.br are confirmed. On 2380 at 2100-0800 (Samuel Cássio, DX Clube do Brasil)

Reactivated after several years: Rádio Difusora, Taubaté, SP on 4925 at 0520 with Show da Madrugada; and Rádio Canção Nova, Cachoeira Paulista, again on 6105 at 0535 with religion // 4825 but 9675 inactive for some time (Samuel Cássio, DX do Clube do Brasil)

BURKINA FASO, CAMEROON, CENTRAL AFRICAN REPUBLIC, CHAD During a brief visit to Ghana, nothing heard from these countries on SW (Chris Greenway, BDXC-UK)

BURMA [non] Democratic Voice of Burma (Burmese: *"Democratic Myanmar a-Than"*) is hostile to the current Burmese government (the "State Law and Order Restoration Council", SLORC). Languages: Burmese, Karen, Kayan, Shan. Address: PO Box 6720, St Olavs Plass, 0130 Oslo, Norway. E-mail: dvbburma@online.no Web Site: **http://www.communique.no/dvb** where archive audio is available 24h on demand (© BBC Monitoring March 21)

A-01 DVB:
1430-1455 5945 TAC 200 kW/132 deg
15405 KVI 500 kW/080 deg
17485 MDC 050 kW/055 deg
1455-1530 5945 TAC 200 kW/132 deg
15405 JUL 100 kW/070 deg
2330-0030 9495 JUL 100 kW/080 deg
11590 MDC 200 kW/055 deg

JUL=Juelich; KVI=Kvitsoy; MDC=Madagascar; TAC=Tashkent (Observer, Bulgaria) Note the quick switch at 1455 of 15405 from one site to another (gh)

CANADA Last reported in Feb as off SW and might not come back as transmitter is not suitable – but CHNX, 6130, Halifax NS was back in late March at 0636 with numerous ''Oldies 96, CHNS'' IDs past 0700. Sounds like a bit more than 30 watts. CHNX faces the usual problems of major broadcasters ignoring their presence on 6130. HFCC and IBB schedules shows VOA, DW, BBC, RFE use it during the day, but there is a window open at 0600-1100. Next night at 0600-0630 had tape loop starting with a whoosh:

''This is CHNX, rebroadcasting the programming of Oldies 96, CHNS, Halifax, Nova Scotia, Canada, on 6130 kHz on the 49 meter band. Our transmitting site is located in Rockingham, a suburb of Halifax, and running 24 hours a day. This is CHNX, Shortwave.'' (gh) Clearly audible around 0730 with no QRM - co or adjacent. It faded down into my noise level by about 0820 (Noël Green, England, *World of Radio*) Still 50 watts, 1/4 wave dipole antenna at 50' (Joe Talbot, Red Deer, Alberta, *World of Radio*)

[non] RCI made last minute changes to its A-01 schedule so that English to Africa at 1800-1900 would go out via four sites, including the newly-available Abu Dhabi facility:

13690 300 110 ME/Af via Skelton, UK
15200 300 128 Af via 'Armavir', Russia
17820 250 230 Af via Dhabayya, UAE
21570 500 189 Af via Ramphisham, UK

(Ricky Leong, QB) Note that at other hours, both 17820 and 21570 come from other sites (gh)

*All times UTC; All frequencies kHz; * before hr = sign on, * after hr = sign off; // = parallel programming; + = continuing but not monitored; 2 x freq = 2nd harmonic; A-01=summer season; [non] = Broadcast to or for the listed country, but not necessarily originating there; u.o.s. = unless otherwise stated*

CHINA Chinese on 25249.96 at 1200, unlisted. Harmonic? (J W Schermerhorn, NY, swl@qth.net) 5 x 5050 kHz, nice catch (Tim Bucknall, harmonics@yahoogroups.com) There is also a 7th harmonic (35350), audible here via evening trans-equatorial propagation (Tony Mann, Perth, Australia, *ibid*.) 25250 harmonic peaking at 1310 here in TN, gone by 1335, narrow opening, probably again in the fall (David Hodgson, Nashville, *DXLD*) 5050 is Guangxi Foreign BS 1200-1400 daily in Cantonese from Nanning, 15 kW, 225 degrees (Nagoya DX Circle) New China Frequency List has been compiled by the NDXC (Shigenori Aoki), at **http://www2.starcat.ne.jp/~ndxc/** (Bob Padula, Victoria, *DXLD*)

[non] Of particular note in the RCI schedule of foreign relays is the addition of three hours of relays of China Radio International in the morning. These are former RCI/CBC program frequencies, so habitual listeners were in for a rude awakening:

1200-1259 11855 250 kW 240d to USA [Chinese]
1300-1459 13650 250 kW 285d to USA [English]

Unfortunately 13650 confronts off-frequency V. of Korea producing het, in Spanish during first hour. The CRI relays via Cuba continue on 9570 before 1400, and 17720 afterwards, running about a second behind 13650. Also reconfirmed CRI via Cuba: 2300 on 5990, 0100 on 9570. It could be months, or years, before CRI gets around to publishing and announcing these frequencies (gh)

COLOMBIA R. Auténtica, Villavicencio, as strong on 2nd harmonic 11949.44 as on fundamental 5974.72 around 0530 with religious talk, jazzy background music. Also check 3rd, 4th and 5th harmonics around 17925, 23900, 29875 (gh, OK)

On 2200.13, HJMK, Emisora Ideal, (harmonic 2 x 1100) at 1009 sign-on with ID. Sustained S-7 (Mark Mohrmann, Coventry VT)

CROATIA [non] Croatian Radio resumed SW via Germany April 8, to AuNZ 0500-0700 9470, 0700-0900 13820 (Craig Tyson, and Matt Francis, SW Australia) Also 2300-0500 9925 to Ams, but mostly music except Croatian news on hour, no Spanish or English yet (gh, OK)

CUBA RHC A-01 English:

2030-2130 13660-USB Eu, 13750 Roma
2230-2330 9550 Caribe
0100-0500 11705-USB Eu, 9820 Chicago, 6000 Washington
0500-0700 9830-USB Eu, 9550 New York, 9820 San Francisco

Transmitters listed under each of three sites are numbered, but not consecutively, and with some numbers missing, making us wonder if the ones not shown are out of service, dedicated to CRI, or reserved for jamming!

Bauta has transmitters numbered 1, 2, 5, 8, 9 and 12. Bejucal has 2, 1, 6 and 9. Titán has 2, 4 and 3. As for powers, Bauta, 2 x 100 kW, 1 x 75 kW, 2 x 20 kW, 2 x 10 kW. At Bejucal, 3 x 50 kW, 1 x 100 kW. At Titán, 3 x 250 kW (RHC spreadsheet via Volker Willschrey)

CYPRUS GREEKISH CBC Nicosia SW schedule in Greek, 314-315 degrees towards W & C Eu, Fri/Sat/Sun only, via Merlin site Zyggi, east of Limassol: 2215-2245 on 6180, 7205, 9760 (Andreas Volk, ADDX, via *BC-DX*)

CZECH REPUBLIC Radio Prague competition for its 55th anniversary. In just a few sentences answer two questions: 1. How did you become a listener to Radio Prague? 2. Imagine that Radio Prague is a human being and then describe him or her. Reply by P- or E-mail. Deadline June 30. Results will be announced July 27-29. Grand prize is a one-week all-paid trip to Czech Republic for two (incl. air fare). Other winners will receive radios, hip bags, T-shirts, etc. Every participant will receive a souvenir (Andrei Tavrizov in *Moscow DX Bulletin* via Sergei Sosedkin)

ECUADOR HCJB's new 2300-0100 to India on 17660 is fair here, and should be better eastwards, an alternative in ENAm for those who want to hear HCJB before 8/9 pm local. *DX Partyline* first airing is now UT Friday 2310; new 24h stream via **http://www.hcjb.org** includes only certain English broadcasts, including *DXPL* only at 0610 UT Sat, 0110 UT Sun (gh, OK)

On 4767.79 a Radio Panamericana at 1145, and 0130*. Could be 3 x 1590 nominal from Quero (Björn Malm, Quito, *SW Bulletin*)

EGYPT General Service IDs as "Arab Republic of Egypt Radio from Cairo" (Arabic: *"Idha'at Jumhuriyat Misr al-Arabiyah min al-Qahirah"*). Subject to Summer/Winter time changes. Address: PO Box 11511, 1186 Cairo. Fax: +20-2-578-9491. Web Site: **http://www.sis.gov.eg/** SW schedule:

0100-0250 12050
0250-0600 9620 9770 9800 12050
0600-1000 9800 11785 12050 15115
1100-1200 9850 11785 12050
1200-1400 9850 11785 12050 17670
1400-1700 9850 12050 17670
1700-2300 9850 12050
(© BBC Monitoring)

FINLAND Aside from 1230 to NAm, only other YLE English on SW is 0630-0658 to Eu/As/Au on 15135 and 21670 (Joe Hanlon)

FRANCE Radio France International was heard with a good signal at 1200 to Africa on 25820; it had news followed by David Page's *Club 9516* (Joe Hanlon in Philadelphia, *DX Listening Digest*) *Club 9516* now only around 1205, 1630 Suns (gh)

GABON Africa No. 1, 1802-1843+ on 19160 = 2 x 9580 which was not heard but \\ 15475 was better (Harold Frodge, MI, *World of Radio*)

GALÁPAGOS ISLANDS La Voz de Galápagos, long gone from 4810, has verified a follow-up 1976 report. Friendly verie letter from Nancy Tasipanta, Estudio Contabilidad along with a postcard of one of the Franciscan monks with a huge turtle called "Pepe", and a tourist brochure. Now might be a good time to write to Nancy if you are sitting on a report too (Paul Ormandy, NZ, ARDXC)

GOA All India Radio via Panaji site on new 9895 for English news 1531-1545 (Bill Flynn, OR, *DXLD*)

GREECE [non] ERA5 via Delano, Greenville, USA sites for A-01, azimuths:

9775 1200-1500 DL 075
11900 0600-0800 DL 296
17565 2000-2200 GA 164
17705 1600-2200 DL 075

Hellenes Around the World, Sat 1600-1700 on 17705; *It's All Greek to Me*, Sun 1800-1900 on 17705. English news to NAm shifted to 0200-0210 M-F (John Babbis) From best to worst: 12105, 7475, 9420, 11645 (gh, OK)

HONDURAS When the Venezuelan was off, caught on 4830.07 Radio Litoral, La Ceiba at 0225. Varies +/- 1/100 of a kHz (Björn Malm, Quito, Ecuador, *SW Bulletin*)

HUNGARY R. Budapest A01 English:

1900-1930 6025, 7130 Eu
2100-2130 6025 Eu
2130-2200 3975 Eu
0100-0130 9560 NAm
0230-0300 9570 NAm

(R. Budapest website via Daniel Sampson)

R. Budapest might have anticipated the clash on 9570 with CRI Chinese via Cuba at 0230. Perhaps CRI has never bothered to register this relay which has been going for a couple of years already? At least Romania is no longer on 9570 at that time (gh)

INDIA All India Radio 1745-1945 English and 1945-2030 French on 13795 ex 13750 (*Observer*, Bulgaria) Long overdue, to avoid Costa Rica and Cuba, now only a 2-way clash (gh)

IRAN Starting A-01 March 25, IRIB in English at 1930-2030 very strong on new 13730 (John A. Figliozzi, NY, and Ivan Grishin, Ont.) 500 kW, 313 degrees toward us (HFCC A-01 listings) Very weak and fadey signal here, completely unusable. Just another example of the drastic disadvantage we face in CNAm for high-latitude paths (gh) 0030 English to NAm on 9022, 9835 and one other (Bob Thomas, CT, *DXLD*) 11970 is other one listed, while 9022 is not, but 11970 blocked by Cuba (gh)

I sent VOIRI a reception report on three separate broadcasts, no return postage. Correct address is: VOIRI External Service, P.O. Box No. 19395-6767, Tehran, Iran. A sesquimonth later I received a package containing a partial data QSL card, another blank QSL card, a signed letter, three magazines, a short novel, a VOIRI broadcast schedule, a new reception report form, and several stickers. Their letter asked that in future reports, I provide personal details such as my "hobbies, occupation, religion, thoughts and ideas about life in general as well as other interesting things..." They also invited comments, suggestions and criticisms about VOIRI. Follow these hints and you should "earn" your VOIRI QSL! (David M. Martin, Atlanta, swl@qth.net)

[non] Radio Voice of Iran (*Radyo Seda-ye Iran*) [via Moldova] *1630-1830* on 11535 or 11540 or 11590, changes freqs every day trying to avoid Iranian jammers (Roberto Petraitis, Lithuania, *Clandestine Radio Watch*)

IRAQ [non] Voice of Islamic Revolution in Iraq, in Arabic via Iran A01: 0330-0530 on 9535, 9685, 7120, 7245 (R. Petraitis, Lithuania, *Clandestine Radio Watch*)

ITALY Rai heard at 0535-0555 on 17710 in Arabic, first half of which is Qur'an, instead of Angelus or something Catholic. Despite rumors of schedule overhaul, English still at 0050 on 11800, 9675, no Qur'an (gh, OK)

JAPAN R. Japan has moved its website to **http://www.nhk.or.jp/nhkworld/index.html** (Daniel Sampson, WI, Prime Time Shortwave **http://www.angelfire.com/wi2/shortwave/**) NHK Warudo now has Japanese lessons at **http://www.nhk.or.jp/lesson/** (Konstantin Gusev, *DX_Bistro* via Sergei Sosedkin)

KOREA SOUTH RKI kept morning relay via Canada at same UT this summer for first time, 1130 on 9650, when more of us are awake, instead of 1030, but higher frequency 11715 might hold up better in deep summer. A good option to hear the entire hour of RKI in the mornings, in W&CNAm, is 13670 at 1300, non-directional (gh, OK)

KURDISTAN [and non] Voice of Iranian Kordestan Web Site: **http://www.pdk-iran.org** on 3985v (from 3940 to 4200) daily 1400-1530 Kurdish, 1530-1600 Persian, repeated next day 0200-0400. Radio Freedom, Voice of the Communist Party of Iraqi Kurdistan, appears to share facilities with the Iraqi Communist Party station, Voice of the Iraqi People. Daily 1600-1600 in Kurdish on 3905v. Voice of the Iraqi People, daily in Arabic 1630-1730, repeated 0300-0400 on 3905v, 5910v. Voice of Kurdistan Toilers, in support of the Sulaymaniyah-based Kurdistan Toilers Party, 4250v, daily 1500-1630 Arabic, 1630-1730 Kurdish, both repeated next day 0300-0430 and 0430-0530 (© BBC Monitoring)

R. Bopeshawa, clandestine via Bulgaria, on new 9960 ex-9450, 1 kHz tone up to program start at 1500. At 1450 the second harmonic on 19920 was strong, but it faded before 1500 (Olle Alm, Sweden, *Cumbre DX*)

LITHUANIA R. Vilnius unlike last summer when it was via Germany, unexpectedly shifted English to NAm one UT hour earlier to 2330 on 9875 (Bob Thomas, CT)

MALAWI MBC is off SW due to lack of spares; need to replace expensive $20K transmitter valves (Joseph Chikagwa, MBC, via Hans Johnson, *Cumbre DX*)

MALI CRI Relay A-01 in English: 9890 kHz 1300-1400 UTC, 11735 2000-2127, 13640 2000-2127, 13685 1300-1600, 15125 1400-1600 (Bob Padula, *Electronic DX Press*)

MÉXICO XERTA testing on 4812 or 4813 and moved antenna and transmitter to the building where the studio is. Schedule variable. Possibly Radio Transcontinental may change to *"La Estrella del Milenio"* (Héctor García Bojorge, DF, *Cumbre DX*) Heard on approx. 4812.6 one afternoon in the noise, no contact

info given (Iván López Alegría, Nayarit, *DX Listening Digest*) 500 watts, M-F 0000-0600, 24h Sat until early Sun (Juan José Miroz, *Noticias DX*)

This year DST in Mexico is shorter, from first Sunday in May until last Sunday in September; except Chihuahua, no DST; and BCN on same dates as Alta California. (Fernando García, NL, *WTFDA*) Meanwhile, XERMX stayed on UT-6 schedule in April (gh)

NIGERIA Instead of Liberia, High Adventure is now planning to set up a SW station in Jos for regional coverage along with local FM (website via Hans Johnson, *Cumbre DX*) There are no private or foreign-owned SW stations in Nigeria, surely no accident; so does HAM really have permission to do this? (gh) I'm amazed that HAM have a licence to broadcast from Jos "to reach Nigeria's Muslim neighbours" and also want to broadcast on FM in Jos itself. Nigeria has been the scene of recent violence between Muslims and Christians, and Jos is in the mainly Muslim north. HAM's plans are likely to provoke debate within Nigeria and its neighbours (Chris Greenway, England, *DXLD*) The approaching shadow of Islam is already destroying the peace of 3 of Nigeria's states and threatening to engulf that nation of millions. Christian leadership in the government – right up to the President himself have pursued High Adventure, hoping we could bring radio to the countless millions in Nigeria and its neighboring countries where Islam is spreading at an alarming rate. We must not let this happen – we must take Africa for Christ (Jackie Yockey, High Adventure newsletter at **http://www.highadventure.org/news.html** via Mike Terry, BDXC-UK)

PAKISTAN R Pakistan's A01, both external and World services: **http://www.radio.gov.pk/exter.htm** and **http://www.radio.gov.pk/world.htm** (Paul Ormandy, *hard-core-dx*)

Viz. the only English: 1600-1615 UT 11570 15100 15725 17720 kHz; 0800-1104 Urdu, but we know there are bits of English at start and finish, 17520 21465. Assami Service in English 0045-0115 11650 15455. We also know that frequencies as a rule are slightly off (gh) Latter measured on 15455.96 and 11649.57 (Mark J. Fine, VA)

PALESTINE [non] Voice of Palestine, Voice of Palestinian Islamic Revolution, in Arabic via Iran A01: 0330-0430 on 9610, 11870 and 1930-2030 on 6025, 6200, 9705, 9860, 11740, 11840 (R. Petraitis, Lithuania, *Clandestine Radio Watch*)

PAPUA NEW GUINEA Pangtel is 100% behind our SW project and approved frequency 3190 for our use! We still have to get the transmitter here from the US (Brad Wells, KBBN, via Don, *DXLD*) They have assigned 20 SW frequencies in the past to other church groups who have not done anything with them. This is why they have been hesitant to give us a frequency (Wells, *Cumbre DX*)

PERÚ 5067.10, Ondas del Suroriente, Quillabamba at 0105 ID after a 5 minute block of ads. 5632.94, Radio Cajabamba, Cajabamba until 0140*; was an unID first heard May 2000 on same exact frequency; announces as on 5050 (Björn Malm, Quito, Ecuador, *SW Bulletin*)

QATAR Radio Qatar in Arabic observed on three new frequencies: 0707-1306 11820 – from 1200 totally blocked by BBC also in Arabic; 1307-1706 17795 excellent but unregistered; 1707-2126 7110, strong clash with Tunisia also in Arabic (*Observer*, Bulgaria)

SERBIA At presstime, R. Yugoslavia still had not returned to SW, but registered a full schedule for A-01, much like the old one, but listed as Beograd rather than Bijeljina, despite 250 kW power and antenna complement of Bijeljina. Wish-list includes English to NAm on 11870 at 0000-0030 (exc Sun) and 0430-0500 daily, 310 and 325 degrees respectively (gh, from HFCC)

SLOVAKIA RSI announced English to NAm 0100-0130 on 5930 6190 and 9440, different from published (Michael Beesley, UK, World DX Club) Originally 7230 instead of 6190; complaints from hams? (Mike Barraclough, England)

SPAIN *Amigos de la Onda Corta*, REE's DX program now has three airings: Sat 1105-1125 15585 Eu, 9660 As; 1805-1825 17755 Af; Sun 0105-0125 15160 11680 9620 9540 6020 Ams (Lenildo C. Silva, Brazil, *radioescutas* and Rubén Guillermo Margenet, Rosario, Argentina, *DXLD*)

New E-mail address for DX and reception reports: dxree.rne@rtve.es (Pilar Salvador, Relaciones con la Audiencia, REE, via Col. John Standingbear)

TUNISIA RTT Sfax, 500 kW each on 7110 and 7225 between 1700 and 2300 put spurious mixes on symmetrical 7340 and 6995 (Willi Stengel, Germany, A-DX via *BC-DX*)

TURKEY Reshide Morali and her sister say they are committed to continuing their *Live from Turkey* call-in through the summer despite initially light response. It's every Tuesday at 2212-2255 on 11845 and 7190, also webcast via **http://www.trt.net.tr** – click on English at the bottom of the page. She offers to call people at TRT expense if they E-mail her in advance at ankayra@yahoo.com with complete phone number, and if they are sure to be awaiting the call during this time period. It's quite an informal, friendly show. Such work beyond the call of duty to promote listener contact, staying up until 2 am local, should not go unrewarded (gh, *swprograms*)

UKRAINE Ukrainian Radio announced it plans to start broadcasting in Arabic, Russian, Polish, French, Spanish (Vladimir Gudzenko, MIDXC via *Signal*)

U A E UAE Radio Dubai, English 1330-1350 and 1600-1634 on 13630 13675 and 21605; 1030-1050 on 15370 and 21605 (Mike Barraclough, UK, *World of Radio*) At 1330, both 13 MHz blocked here: 13630 totally by R. Martí and a dollop of Cuban jamming, 13675 by Arabic from Iran, a clash which has been going on for a long time (gh, OK) Remaining English at 0330: 13675 booming in here (Fred M. KA1DGL, Tampa FL, swl@qth.net) 0330 I hear on 13675 if propagation is decent; 15400; and 12005 QRMed by Tunisia in Arabic (Bob Thomas, CT)

U K Another BBC WS programme has been quietly cancelled, the amateur astronomy monthly *Seeing Stars*, which used to be part of *Science View* (Will Martin, MO, *DXLD*)

UNITED NATIONS [non] UNR to Af, English M-F 1730-1745 on powerhouse 300 kW Woofferton 15265 and poor Ascension 17580 (Wolfgang Büschel, Germany, *BC-DX*) 17580 much better here, with heavy CRI on 15265 (Chris Hambly, Victoria, *DXLD*)

U S A Sanford J. Ungar, VOA Director held over from the Clinton Administration, said he would keep working there until June 30, then begin a new job as president of Goucher College, a 1700-student liberal arts and science college near Baltimore (VOA via Kim Elliott, and Washington *Post* via Mike Cooper) We don't know if President Bush will name a successor in time for his June 30 departure, or if we will be under an acting director for a while (Kim Elliott)

Voice of America Will Retool for Arab World: With pervasive anti-American sentiment in the Arab world threatening President Bush's Middle East policy, VOA wants to completely remake its Arab-language broadcasts to appeal to a younger, more radical audience (Norman Kempster, Los Angeles Times via Chet Copeland) Full story may still be at: **http://www.iht.com/articles/15755.html** (via Artie Bigley)

VOA is reconsidering its decision to shut down the Thai service, after many protests from high government officials that it is an important factor in relations between the two countries (*Bangkok Post* via Mike Cooper)

R. Free Asia has an open competition for new identification music. Winning composer will receive a generous honorarium. All entries must be received by June 30. Contestants shall be notified of the result by July 31, 2001. Details on procedure from: Alice Egyed, Ph.D., Director of Music, Radio Free Asia, 2025 M Street, Suite 300, Washington, DC 20036; egyeda@rfa.org or phone: 202-530-4999/ext. 1066, fax: 202-271-7468 (via Kim Andrew Elliott, VOA)

WRNO Worldwide is sold to a non-profit religious group, whose directors include a citizen of Zimbabwe and a citizen of Australia. The New Orleans operation was one of the very few attempts to create a viable commercial shortwave operation (doing CHR). It has been in the hands of executor Ashton Hardy. Looks like the Ft. Worth-based Good News World Outreach will run WRNO non-commercially (*Mstreet Daily* via *Cumbre DX*)

On 25910 FM, KKOB Albuquerque NM; 2240-2310+ "News Radio 770 KKOB", "Traffic & weather together on the 7's" (Harold Frodge, MI, *Cumbre DX*) Full data verie on letterhead in 10 days, partly making up for never QSLing my 770 reception earlier. V/S Mike Langner, C.E. says ''newly-installed FCC Part 74 transmitter to send 'pre-profanity delay' audio when stations in our cluster broadcast from remote locations. Since 'off-air' monitoring when using a 7-second delay is impossible, this will be our headphone and PA system feeds'' (Harold Frodge, MI, MARE)

KPM556 25950 kHz, Portland OR, e-mail verie from Larry Holtz, says a KPM556 ID is given randomly and approximately every 2 hours. Plans to replace the antenna with a better one in June (Ray Crawford, Australia, *hard-core-dx*)

[non] HBS (Christian Science) refuses to publish details of its broadcasts via Merlin relays, and they are also missing from George Jacobs' website; but they are in the Merlin schedule with kilowatts, azimuths. All are daily in English, but many other languages rotate on a complicated schedule depending on day of week (gh)

9875 1200-1300 Vladivostok 500 228 to China
9940 1300-1400 Irkutsk 250 224 to S Asia
11870 1000-1100 Taipei 100 352 to China
17635 1200-1300 Komsomol'sk 250 213 to SE Asia
(via Andreas Volk, ADDX)

AFRTS on new 13254.0 USB after 2000. Good signal (Karel Honzik, the Czech Republic, *Hard-Core-DX*) 13254 rather good here too, 1945-2015, QTH? (Torre Ekblom, Finland, *DXLD*)

URUGUAY 6155, R. Sarandí del Yí heard in morning at 1126 with horserace (Horacio Nigro, Uruguay, DX Listening Digest)

VATICAN Anyone interested in the elettrosmog debate might visit **http://www.radiovaticana.com** for their view, in Italian (Dr Hansjörg Biener, Germany) Prime Minister of Italy overruled Environment Minister and gave VR until end of April to negotiate reduced emissions. On April 16 it reduced MW, and planned to 'de-localize' SW to relay sites (press reports and Stefano Valianti, *DXLD*)

VENEZUELA R. Corsario, pirate on 14540, verifies via **http://www.eQSL.cc** reports sent to radiocorsario@yahoo.com (José M. Valdés R., YV5LIX, Venezuela, *Conexión Digital*) Got my eQSL for this station. Location given as Maracaibo, Venezuela, no power (Alex Ash, IL, FRN *Grapevine*)

VIETNAM V. of Vietnam A-01 schedule shows some relays from new Merlin sites in South Africa and England:

6145 2100-2200 MEY 100 kW 5 degrees
15390 2000-2100 SKN 250 kW 175 degrees

Winter/Summer change for Vietnam outlets is Oct 16/Feb 15 (Rumen Pankov and Wolfgang Büschel, *BC-DX*) Registered but these are not in effect (Bob Padula, *EDXP*) At the homepage **http://www.vov.org.vn** in Vietnamese, 1500-1600 is a time for audio stream, and on the English page 1600-1630. Also ondemand are the last few mailbags, 16 minute file including music. Beware of the heavy-handed propaganda on the page (gh)

Until the Next, Best of DX and 73 de Glenn!

Gayle Van Horn
gayle@webworkz.com

0020 UTC on 4795
BRAZIL: Radio Aquidauna. Low signal for Portuguese announcements and programming. Brazilian **Radio Rural** 4765, 2310-2320. Good signal, poor modulation for religious music and ID as, "Radio Emissora de Educacao Rural." (Daniel Canonica, Muggio, Switzerland)

0023 UTC on 5019.9
COLOMBIA: Ecos del Atrato. Campesino music with a hint of Andean style. Commercial segments 0025-0032 and 0048-0054 many including echo effects. Male/female duo with "atencion" Spanish public service items, followed by children's religious spots. SIO=442. (Harold Frodge, Midland, MI)

0025 UTC on 3360
GUATEMALA: La Voz de Nahuala. Spanish folklore tunes to ID and regional time check at 0038. Tentative log on **Radio Chortis** 3380, 0010-0015. **Radio Verdad** 4052.5 4052.5, 2340-0010, including station ID 0005. (Klaus Elsebusch, Marienthal, Germany/HCDX) **Radio Buenas Nuevas** 4799.8, 1115-1130. (Roy Unger, Front Royal, VA)

0030 UTC on 6120
LITHUANIA: Radio Vilnius. Station identification to report on national trade unions. (William McGuire, Cheveryl, MD) Segment on national education and "welcome to Radio Vilnius." (Elsebusch, Germany/HCDX)

0050 UTC on 11800
ITALY: RAI. World news to feature on national tourism. (David W. Weronka, Benson, NC) News on aid to strife in Congo // 9675. (Bob Fraser, Cohasset, MA; McGuire, MD)

0053 UTC on 15455.96
PAKISTAN: Radio Pakistan. English news read by male announcer interspersed with traditional music until 0113 fadeout. Signal very difficult to pick out of the noise and very unstable. Parallel noted on 11649.57 until top of the hour, when it was interfered by station on 11655. (Mark Fine, Remington, VA)

0100 UTC on 9400
BULGARIA: Radio Bulgaria. Interval signal to ID, frequency schedule and update of the Balkan region. (McGuire, MD; Weronka, NC)

0137 UTC on 7115
SRI LANKA: Voice of America relay. *Communications World* in progress at tune-in 0137 on a UTC Saturday, site listed as Iranawila. Fair to good reception quality. (Walter Salmaniw, Victoria BC, Canada, *Hard Core DX*) SLBC 0205 on 9770 with very signal. (Robert Timek, Milford, MI)

0205 UTC on 6956.62
PERU: La Voz del Campesino. Spanish. Peruvian music program from male announcer's, "...y seguimos con la programacion de esta dia ... por La Voz del Campesino.." (Arnaldo L. Slaen, Argentina)

0329 UTC on 6940
ETHIOPIA: Radio Fana. Amharic programming to instrumental interval signal and sign-on identification. World news text to Ethiopian music and announcer's talk segments, SINPO=34433. Radio Ethiopia 7110, 0348-0403 with vernacular programming to regional music and station ID.(Claudio Morales, Buenos Aires, Argentina)

0335 UTC on 9835
HUNGARY: Radio Budapest. Political and economic news, station ID and discussion about Saudi Arabia. (McGuire, MD)

0445 UTC on 7255
BOTSWANA: Radio Botswana. Setswana. News focus on Botswana, Rwanda and Congo. Regional music to ID. (Morales, ARG)

0532 UTC on 11805.24
GEORGIA: Georgian Radio. Lady announcer's English schedule read followed by music until 0535. Station identification, music and talk regarding the United Nations read by male until 0540. Interference from LSB station and other associated interference, otherwise good signal with somewhat muddled audio. (Fine, VA)

0850 UTC on 11675
NEW ZEALAND: Radio New Zealand Int'l. Book review of *Rich Man, Poor Man, Environmental Thief*, followed by news and weather at 0900. (Martin, VA; Martin Brown, Brampton, Ontario, Canada; Claudio Morales, ARG)

0940 UTC on 4875
BOLIVIA: La Cruz del Sur. Extended Aymara commentary, SINPO=34433. Bolivian stations audible as; **Radio Santa Cruz** 6135, 0957-1007 best in lower side band mode 6134.93; **Radio Illimani** 6025, 1011-1022 Andean solo ballads to Arymara announcement; **Radio Fides** 9625, 1107-1115 Spanish bulletin update to national weather forecast. (Arnaldo L. Slaen, Buenos Aires, Argentina) Audible 4876.80, 2320-2348. (Canconica, SUI)

1730 UTC on 17725
LIBYA: Voice of Africa. Items in Arabic to English service, including Arabic music. Fairly good signal with slight interferences on frequency. French service commences 1740. (Sam Wright, Biloxi, MS; Duane Hadley, Bristol, TN)

1810 UTC on 21470
CYPRUS: BBC relay. Tentative on station logging, English programs included world news features to 1820 and U.K. national news. *World Business Report* 1830-1845, *News Analysis* 1845-1858; French service commencing 1900. If this is Cyprus relay, it's an extension from their posted schedules. Signal strength increased after 1830, no sign of station at 1931 recheck. SIO=454. (Frodge, MI)

1810 UTC on 17870
SOUTH AFRICA: Channel Africa. Segment on South Africa plans aid for Democratic Republic of Congo. (Fraser, MA)

1830 UTC on 9780
YEMEN: Rep. of Yemen Radio. Station ID and intro for music program. R&B tunes to *New York City* from Christopher Cross to Debbie Gibson's *In Your Eyes*. "Thanks for listening to the Republic of Yemen," followed by national anthem to 1900*. (Timek, MI)

1903 UTC on 21815
COSTA RICA: Radio for Peace Int'l. *World of Radio* to RFPI identification at 1930. SIO=354. Tentative Spanish log for Costa Rica's **Faro del Caribe** on 5054.6, 1147-1202+ with announcer chitchat to ballads and campo music. No ID break for 1200.(Frodge, MI) Costa Rica's **AWR** 7375, 0433-0448 with religious programming. (Claudio, ARG)

1905 UTC on 11970
USA: Voice of America. World news to commentary on Israel, followed by identification. (McGuire, MD)

1925 UTC on 13750
INDIA: All India Radio. "Overseas Service of AIR" identification from male host. Local Indian music to feature on India-Chinese security talks. Announced 9650 not heard, continued in French at 1945. AIR 9650, 2214-2223+ with commentary on Pakistan and traditional Indian music. Best to monitor in upper side band // 7410 SIO=53-3, best in lower side band to avoid 7415 WBCQ. (Frodge, MI) Segment on vacationing in India 2115 on 11715. (Timek, MI)

2101 UTC on 11740
MALI: China Radio Int'l relay. Political news update and speculation on the US position on Taiwan. English service continued past 2115, far better signal to monitor in LSB to avoid strong Chinese program on 11740. (Frodge, MI) **RTV Malienne** 2330 on 4835 with French service to martial national anthem at 0000*. (Unger, VA)

2315 UTC on 11945
SPAIN: Radio Exterior Espana. Great signal for station ID, national and regional news. (McGuire, MD)

2324 UTC on 6020
TURKEY: Voice of Turkey. *Hues & Color of Anatolia* program on trade between the Hittites and Syria in the 21st century BC. (Fraser, MA) Audible 1405-1410 on 17815. (Weronka, NC)

Thanks to our contributors – Have you sent in YOUR logs? Send to Gayle Van Horn, c/o Monitoring Times (or e-mail gayle@webworkz.com)
English broadcast unless otherwise noted.

Gayle Van Horn
gayle@webworkz.com

QSLing the Hams on ARRL Field Day

If you are a dedicated verification junkie and love to get QSL cards in your mailbox, you are going to love the weekend of June 23-24. That is the weekend of amateur radio's biggest annual event – ARRL Field Day.

According to the American Radio Relay League (ARRL) the objective of Field Day is "to work as many stations as possible on any and all amateur bands (excluding the 30, 17 and 12-meter bands) and in doing so, to learn to operate in abnormal situations in less than optimal conditions. A premium is placed on developing skills to meet the challenges of emergency preparedness as well as to acquaint the general public with the capabilities of amateur radio."

This all translates to a lot of amateur radio club stations on-the-air in the United States and Canadian trying to work each other over a 27 hour period. These club field day operations are usually excellent verifiers. Many SWLs work all 50 states and all Canadian provinces during an ARRL Field Day weekend.

So, while all those hams are out in the field roughing it, you can sit back in the comfort of your radio shack and rack in the contacts for your logbook and QSLs for your collection. This major radio event starts at 1800 UTC on Saturday, June 23, and concludes 2100 UTC on Sunday, June 24.

QSLing hams couldn't be easier. Note their call sign, frequency, time, date, and who they worked, and give them a signal report. Put this on a card, provide them a self-addressed, stamped envelope (SASE) and get ready to receive a lot of QSLs in your mailbox.

Need that ham's mailing address? It's as close as your Internet connection. The fine folks at QRZ provide an amateur call book online. Go to ***http://www.qrz.com,*** plug in the call sign you heard, and you will get all the information you need to contact that ham via snail mail.

BANGLADESH

Radio Bangladesh, 9550/7185 kHz. Full data scenery card, signed by Dilruba Begum-Director, plus schedule and letter. This is my second QSL and reply after 27 years! Received in eight months for one U.S. dollar and a personal note about them not replying sooner! Station address: External Services, Shahbagh Post Box No. 2204, Dhaka 1000, Bangladesh. (John Wright, Australia/*Cumbre DX*)

GERMANY

Radio Africa Int'l-United Methodist Church, 15485 kHz, via Deutsche Telekom, Julich. Full data verification letter signed by Donna Niemann-Executive Producer, plus broadcast schedule. Received in 14 days for an English report. Station notes plans of issuing QSL cards shortly. Station address: 475 Riverside Dr., New York, NY 10115. (Ben Loveless WB9FJO, Bloomfield, MI)

INDIA

All India Radio-Panaji, 11715 kHz. Full data *Archaelogical Survey of India* card, signed by A.K. Bhatnagar-Director of Freq. Assignments. Received in 102 days for an English report to Delhi headquarters. Station address: Directorate General, A.V. Bhawan, Sansas Marg, New Delhi 110001 India. (Randy Stewart, Battlefield, MO)

All India Radio-Srinagar, 4950 kHz. Full data card signed by A.K. Bhatnagar. Received in 55 days from New Delhi headquarters, P.O. Box 70, New Delhi, India 110 011 India. (Daniel Canonica, Muggio, Switzerland)

IRELAND

Shannon Volmet, 5505 kHz USB. Partial data letter, schedule and station brochure. Received in 331 days for a utility report and one U.S. dollar. Station address: The Irish Aviation Authority, Aviation House, Hawkins St., Dublin 2, Ireland. (George Clement, Powder Springs, GA)

MEDIUM WAVE

KOTX, 1080 kHz AM. Full data verification letter signed by Michael Everhart-Chief Engineer, for special test, off period of KRLD/WTIC. Received in two days for an AM report, cassette recording and return postage. Station address: 2000 SW First St., Suite 300, Portland, OR 97201. (Patrick Griffith, Westminster, CO)

KRLD 1080 kHz AM. Confirmation letter signed by Erik Disen-Director of Engineering, plus frig magnet. Received in 12 days for an AM report and return postage. Station address: 1080 Ballpark Way, Arlington, TX 76011. (Griffith, CO)

KTIK 1350 kHz AM. QSL form letter signed by John Patrick-Operations Manager. Received in eight days for an AM report. Station address: 251 Capitol Blvd., Boise, ID 83702. (Patrick Martin, Seaside, OR)

KRVN 880 kHz AM. Received their "new" QSL, signed by Jim Killen-Director of Engineering, plus bumper stickers. Had this one confirmed, but wanted their new card. Received for an AM report. Station address: 1007 Plum Creek Pkwy, P.O. Box 880, Lexington, NE 68850. (Martin, OR)

MEXICO

Radio Mexico Int'l, 9705 kHz. Full data QSL signed by Lic. Ana Cristiana Del Razo Esqueda-Manager, plus station pennant, schedule, report form and musical CD. Received in three months for an English report. Station address: Apartado Postal-P. O. Box 21-200 C.P. 04021 Mexico, D.F. Mexico. (Don Dacus, Russellville, AR)

PIRATES

ZZ100, 6955 kHz USB. No data email letter from Bill Kelly. Received in two hours for a pirate email report. Email address: <**bigz100fm@yahoo.com**> (Bill Wilkins, Springfield, MO)

Voice of the Angry Bastard, 6950 kHz. Full data Mobster Babe card signed by Joe Stalin, with station info for an FRW log. Also sent a note explaining that a batch of cards sent to Belfast NY didn't make it and speculating that some dude in Belfast, Northern Ireland, is pondering a dilemma. Pirate maildrop: P.O. Box 1, Belfast, NY 14711. (Harold Frodge, Midland, MI)

Jolly Roger Radio Int'l, 6950 kHz. U.S. relay with email response for my email to *JR_ Radio@ hotmail.com*, said QSL would be coming. The P.O. Box address which I couldn't copy is: Joe Vincent, Post Box 39, Waterford, Ireland. Listed website; **http://listen.to.jrri/** (Frodge, MI)

Radio 3, 6240 kHz. Full data QSL sheet signed by Sal. Received in two months for an ACE log. Sample copies of *The ACE* are two US dollars via the Belfast maildrop. (Comeau, MA)

RUSSIA

Radio Studio Doma Radio "Gardarika," signed by Dimitry Vasyliev-SW Project Manager. Station address: 174, St. Petersburg, 190227 Russia. (Canonica, SUI)

THAILAND

Radio Thailand, 9535 kHz. Full data QSL card unsigned, plus program schedule. Received in 35 days for an English report. Station address: 236 Vibhavadi Rangsit Hwy, Bangkok, Thailand 10400. (Loveless, MI)

John Figliozzi
jfiglio1@nycap.rr.com

SRI and Other Tales

About a week ago, I received an interesting packet by postal mail from ***Swiss Radio International***. Signed by Nicolas Lombard, Director and Christine Dudle-Crevoisier, Head of Communication and Marketing, was a two page missive seeking to explain recent "considerable changes" to SRI's service and to "give advance warning of some future developments." Across the top of the letter in bold type were the words, "***Replacement of radio programmes by an on-line service.***"

In sum, ***SRI*** has decided to end its use of shortwave by 2004 – and to cut its satellite broadcasting to an English language service only – in favor of its Internet site, ***www.swissinfo.org***. The letter gives three reasons for this decision:

1.) The majority of Swiss expatriates live in Europe where they have easy access to many forms of electronic media and "information of all kinds about Switzerland."

2.) The increasing development and "popularity" of on-line services "in all parts of the world…means that providers of international services are almost obliged to switch to the Internet."

3.) "The competition generated by new sources of information…means there are only very limited prospects for expensive shortwave services."

The letter goes on to describe ***swissinfo.org*** as an "excellent alternative" that provides a constant stream of information in the form of text, pictures, sound and video. ***Swissinfo.org*** provides international and Swiss news, business reports, arts and cultural information and sport. There's a travel guide, road condition reports, interactive maps, the latest Zurich stock market prices, currency exchange rates, a calendar of key events in Switzerland and weather forecasts. There is also a database of over 6000 links to other Swiss websites and even a free e-mail service. There is even an innovative text service designed specifically for mobile devices to permit one to "keep in touch" regularly with Switzerland.

Radio vs. The Internet

Let me say this prominently – ***This is an excellent Internet site with many fine features***. There's a lot to like about ***swissinfo.org***, as there is to like about the Internet. There's only one problem – and it's a big one. ***IT'S NOT RADIO!*** *The internet is a medium all to itself; but it is not and will never be a substitute for radio.* The two mediums do different things in different ways. One is not intrinsically better than the other; they're just different!

For one thing, radio is an extremely mobile, portable medium that "pushes" information, music and entertainment to the listener. It demands little in the way of immediate or persistent interaction from the listener beyond choosing the station. Its greatest asset is that it can be comfortably used while performing other tasks like writing, driving, yardwork, housecleaning, etc. The user can choose to remain with a station until it catches his or her attention with something of interest, or change the station to receive material that is more closely attuned to his or her needs at a particular time. One can listen leisurely or attentively. Furthermore, there are no connection charges or subscription fees. It is available free of charge beyond the purchase of the radio necessary to receive it.

The Internet, on the other hand, demands much more continuous attention from the user. Its greatest asset may be that a skillful user can "pull" just the information, music and entertainment he or she wants in a very precise way. The Internet, at least for the present and foreseeable future, is much less a portable or mobile medium, especially when compared with radio. It can be very costly to use – almost requiring the user to be efficient and the use to be limited. Furthermore, its use of a screen in all of its iterations at least implies that it is meant to be viewed and heard at the same time. (For example, when sampling the ***swissinfo.org*** site, I found myself wanting something to look at while I listened to the various reports and features being streamed to me. As I sat in front of the computer, I got increasingly fidgety...but this reaction may not be typical.)

How Did SRI Get Here?

In truth, the actions of ***SRI*** management over the past seven years preordained this result they now claim was inevitable. It was in 1994 that ***SRI***, declaring that satellite was the wave of the future, first pronounced the death of shortwave. It threw most of its assets into satellite distribution, gutted what had been a lively and popular shortwave service and replaced it with a comparatively sterile news and information service. One year later, though, when the satellite service proved to be unsuccessful outside Europe, ***SRI*** shortwave had a partial revival. Some features were restored.

But the damage had been done. With only puny resources grudgingly allocated to programming, these features paled in comparison to the station's pre-1994 fare. In 1998, *Rendezvous with Switzerland*, a fine program that compared favorably to those of SRI's storied past, debuted and garnered significant positive audience reaction. Nonetheless, in the fall of 2000, it was suddenly cancelled without warning. Inquiries to the station yielded only perfunctory explanations of resource restrictions.

Now ***SRI*** management has decided that both satellite and shortwave belong on the scrap heap of history. It is no exaggeration to say that, in the space of less than a decade, ***SRI*** administrators have managed to turn what was once one of the world's most popular international broadcasting services into a rather unremarkable enterprise.

A Wrong Turn?

To be effective today, entities like ***SRI*** must try to be everywhere – shortwave, local placement on AM/FM, the Internet, satellite, digital. There is no doubt that this significantly increases expenses placing great pressures on decisionmakers to smartly allocate scarce resources. In that regard, if what ***SRI*** is saying is that it sees no future for itself in radio, so be it. It's a grave mistake in today's media environment, management's rather tortured explanations notwithstanding. Nonetheless, ***SRI*** has the right to act on its vision of the future as it sees it.

But ***SRI*** shouldn't pretend that its Internet site is or will be a substitute for radio; or claim that radio is a dying medium; or claim that circumstances beyond their control have entirely forced their hand. Because that just ain't so.

SRI EXITS THE STAGE

SRI will discontinue ***shortwave*** broadcasting in three stages:

Western North and Central America and Australia	24 Mar. 2001*
Eastern North and Central America, Europe and Asia	27 Oct. 2001
Near East, Africa and South America	end 2004

(*already accomplished)

SRI will discontinue ***satellite*** broadcasting as follows:

North and South America via *NSS-K*, Australia and Asia via *Asiasat-2*, Near East and Africa via *Intelsat-707*	31 Dec. 2001
Europe via *Astra-1B*	31 Dec. 2002*

(*from 1/1/02, ***SRI*** will broadcast to Europe only via *Eutelsat-HB3*. After 31 Dec. 2002 this will be the ***only*** remaining ***SRI*** satellite channel and *after 2004 only an English language service will be broadcast.* However, SRI will decide whether to lease additional satellite space in the next two or three years to provide English language broadcasts to other continents.)

How to Use the Shortwave Guide

0000-0100 twhfa USA, Voice of America 5995am 6130ca 7405am 9455af

① ② ⑤ ③ ④ ⑥ ⑦

Convert your time to UTC.

Broadcast time on ① and time off ② are expressed in Coordinated Universal Time (UTC) – the time at the 0 meridian near Greenwich, England. To translate your local time into UTC, first convert your local time to 24-hour format, then add (during Daylight Savings) 4, 5, 6, or 7 hours for Eastern, Central, Mountain or Pacific Times, respectively. Eastern, Central, and Pacific Times are already converted to UTC for you at the top of each page.

Note that all *dates*, as well as times, are in UTC; for example, a show which might air at 0030 UTC *Sunday* will be heard on *Saturday* evening in America (in other words, 8:30 pm Eastern, 7:30 pm Central, etc.).

Find the station you want to hear.

Look at the page which corresponds to the time you will be listening. On the top half of the page English broadcasts are listed by UTC time on ① , then alphabetically by country ③, followed by the station name ④. (If the station name is the same as the country, we don't repeat it, e.g., "Vanuatu, Radio" [Vanuatu].)

If a broadcast is not *daily*, the days of broadcast Ä will appear in the column following the time of broadcast, using the following codes:

Day Codes

s/S	Sunday
m/M	Monday
t/T	Tuesday
w/W	Wednesday
h/H	Thursday
f/F	Friday
a/A	Saturday
D	Daily
mon/MON	monthly

In the same column ⑤, irregular broadcasts are indicated "tent" and programming which includes languages besides English are coded "vl" (various languages).

Choose the most promising frequencies for the time, location and conditions.

The frequencies ⑥ follow to the right of the station listing; all frequencies are listed in kilohertz (kHz). Not all listed stations will be heard from your location and virtually none of them will be heard all the time on all frequencies.

Shortwave broadcast stations change some of their frequencies at least twice a year, in April and October, to adapt to seasonal conditions. But they can also change in response to short-term conditions, interference, equipment problems, etc. Our frequency manager coordinates published station schedules with confirmations and reports from her monitoring team and *MT* readers to make the Shortwave Guide up-to-date as of one week before publication.

To help you find the most promising signal for your location, immediately following each frequency we've included information on the target area ⑦ of the broadcast. Signals beamed toward your area will generally be easier to hear than those beamed elsewhere, even though the latter will often still be audible.

Target Areas

af:	Africa
al:	alternate frequency (occasional use only)
am:	The Americas
as:	Asia
au:	Australia
ca:	Central America
do:	domestic broadcast
eu:	Europe
irr:	irregular (Costa Rica RFPI)
me:	Middle East
na:	North America
om:	omnidirectional
pa:	Pacific
sa:	South America
va:	various

Choose a program or station you want to hear.

Selected programs appear on the lower half of the page for prime listening hours – space does not permit 24 hour listings nor can every station be listed. However, listings for the most popular stations and selected lesser-known stations illustrate the variety available on shortwave. The format of the listings alternates among three different styles – by station, by genre and by day – month by month. Times listed are approximate and programs are subject to change.

The program listings emphasize broadcasts targeted to North America. In most cases, the stations and programs listed should be readily receivable in North America using a portable radio. Most broadcasters produce one broadcast in English per day that is repeated over a 24 hour period to all areas. If you are able to listen to transmissions to other areas of the world during "non-prime time" hours, referring to the prime time listings for those stations will likely be helpful in determining what programs will be broadcast.

Occasionally, a program or station listing may be followed by a reference to another listing for the same program or station at a different time. This is done to conserve space and make it possible to provide more listings.

MT Monitoring Team

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A Word About Our Format Change

Monitoring Times is fortunate to have had a series of dedicated programming managers – Kannon Shanmugam, Jim Frimmel, and John Figliozzi – who have constantly tried to improve the quantity and usefulness of the program information they compile. John Figliozzi is eager to provide readers with all the information at his disposal, but after trying for several months to force new material into an old layout, we are returning in this issue to the section's original format. Instead of placing frequencies and programming on the same page, the frequency section (with no format changes) is presented first, followed by programming details.

Although it means the reader must flip pages to find frequencies for the program of interest, we believe the benefits will outweigh the inconvenience. We can present program information in a more legible font size; we'll have complete flexibility within sections; we can even change the hours for which programming is provided. Since the Shortwave Guide is the last section of the magazine to be submitted, we don't have a lot of spare hours to make it fit each month. The new format will accommodate all the great information John has been providing without sacrificing your eyesight or our deadline!

John will continue to alternate the three presentations he has established in 2001: Selected Programs by Station, by Day, and by Type. This month's listing is by day. You may want to photocopy or tear out your favorite format and keep those six or seven pages tucked into the frequency section in subsequent months. John's program database is also accessible on the internet at ***http://www.anarc.org/naswa/swlguide***

John Figliozzi (*jfiglio1@nycap.rr.com*) and I welcome your comments and suggestions as we strive to produce the most comprehensive, most up-to-date, and the most useful shortwave broadcast guide in print.

– Rachel Baughn
(*mteditor@grove-ent.com*)

Thank You ...

Additional Contributors to This Month's Shortwave Guide:

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Shortwave Guide

0000 UTC - 8PM E / 7PM C / 5PM P

0000	0015		Cambodia, National Radio Of	11940as			
0000	0015		Japan, Radio	6145na	13650pa	17810pa	
0000	0027		Czech Rep, Radio Prague Intl	7345na	11615na		
0000	0030		Egypt, Radio Cairo	9900am			
0000	0030		Thailand, Radio	9655af	9690af	11905af	
0000	0030		UK, BBC World Service	3915as	5965as	5975am	6175na
				6195as	7105as	9410me	9590am
				9915sa	11945as	11955as	12095sa
				15280as	15310as	15360as	17615as
				17790as			
0000	0045		India, All India Radio	9705as	9950as	11620as	13605as
0000	0056		North Korea, Voice of Korea	4405va	11460na	11710na	13760na
				15180na			
0000	0057		Canada, R Canada International	11895as			
0000	0100		Anguilla, Caribbean Beacon	6090am			
0000	0100	vl	Australia, ABC/Alice Springs	4835do			
0000	0100	vl	Australia, ABC/Katherine	5025do			
0000	0100	vl	Australia, ABC/Tennant Creek	4910do			
0000	0100		Australia, Christian Voice	17775pa	21680pa		
0000	0100		Australia, Radio	9660pa	12080pa	15415as	15240as
				17580va	17750as	17795va	21740va
0000	0100		Canada, CBC Northern Service	9625do			
0000	0100		Canada, CFRX Toronto ON	6070do			
0000	0100		Canada, CFVP Calgary AB	6030do			
0000	0100		Canada, CHNX Halifax, NS	6130do			
0000	0100		Canada, CKZN St John's NF	6160do			
0000	0100		Canada, CKZU Vancouver BC	6160do			
0000	0100		Costa Rica, R for Peace Intl	7450irr	15049va		
0000	0100		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na		
0000	0100		Ecuador, HCJB	9745na	15115na	21455usb	
0000	0100	a/monthly	Finland, Scandv Weekend Radio	11720va			
0000	0100		Guyana, Voice of	3289do	5949do		
0000	0100		Japan, Radio	6145na			
0000	0100		Malaysia, Radio	7295do			
0000	0100		Malaysia, RTM Kota Kinabalu	5980do			
0000	0100		Malaysia, RTM Sarawak	7160do			
0000	0100	vl	Namibia, Namibian BC Corp	3270af	3289af		
0000	0100		Netherlands, Radio	6165na	9845na		
0000	0100		New Zealand, R New Zealand Int	17675pa			
0000	0100		New Zealand, ZLXA	3935do	7290do		
0000	0100	vl	Papua New Guinea, NBC	9675do	11880irr		
0000	0100		Singapore, SBC Radio One	6150do			
0000	0100	vl/as	Solomon Islands, SIBC	5020do			
0000	0100	vl/a	Solomon Islands, SIBC	9545do			
0000	0100		Spain, R Exterior Espana	15385na			
0000	0100		Ukraine, R Ukraine International	5905eu	7320eu	9640eu	13590na
0000	0100		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
0000	0100		USA, KAIJ Dallas TX	13815va			
0000	0100		USA, KTBN Salt Lake City UT	15590na			
0000	0100		USA, KWHR Naalehu HI	17510as			
0000	0100	twhfa	USA, Voice of America	5995am	6130am	7405am	9455am
				9775am	11695am	13740am	
0000	0100		USA, WBCQ Monticello ME	7415na	9335na		
0000	0100		USA, WEWN Birmingham AL	5825na	13615na		
0000	0100		USA, WHRA Greenbush ME	7580eu			
0000	0100		USA, WHRI Noblesville IN	5745va	7315am		
0000	0100		USA, WINB Red Lion PA	12160am			
0000	0100		USA, WJCR Upton KY	7490am	13595as		
0000	0100		USA, WRMI Miami FL	9955sa			
0000	0100		USA, WRNO New Orleans LA	7355va			
0000	0100		USA, WSHB Cypress Crk SC	7535am	9430am	15285sa	
0000	0100		USA, WTJC Newport NC	9370na			
0000	0100	sm	USA, WWBS Macon GA	11910na			
0000	0100		USA, WWCR Nashville TN	5070na	7435na	9475na	13845na
0000	0100		USA, WWFV McCaysville GA	5085va	6890am		
0000	0100		USA, WYFR Okeechobee FL	6085na	9505na		
0000	0100	vl	Vanuatu, Radio	3945do	4960do	7260do	
0000	0100		Zambia, Christian Voice	4965do			
0030	0100		Iran, VOIRI	9022am	9835am	11970am	
0030	0100		Sri Lanka, Sri Lanka BC Corp	4940do			
0030	0100		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as
				15425as			
0030	0100		Thailand, Radio	9655as	11905as	15395na	
0030	0100		USA, VOA Special English	7215as	9770as	11760as	15185as
				15290as	17740as	17820as	
0030	0100		USA, Voice of America	7215as	9770as	11760as	15185as
				15290as	17740as	17820as	
0045	0100		Pakistan, Radio	11650as	15455as		
0050	0100		Italy, RAI International	9675na	11800na		
0050	0100		UK, International BC Tamil	11570as			

0100 UTC - 9PM E / 8PM C / 6PM P

0100	0110		Italy, RAI International	9675na	11800na		
0100	0115		Pakistan, Radio	11650as	15455as		
0100	0125		Netherlands, Radio	6165na	9845na		
0100	0127		Czech Rep, Radio Prague Intl	5915na	7345na		
0100	0127		Vietnam, Voice of	9525na			
0100	0130	s	Germany, Universal Life	9435as			
0100	0130		Hungary, Radio Budapest	9560na			
0100	0130		Iran, VOIRI	9022am	9835am	11970am	
0100	0130		Slovakia, R Slovakia International	5930na	7230ca	9440sa	
0100	0130	twhfa	USA, Voice of America	5995am	6130am	7405am	9455am
				9775am	13740am		
0100	0130		Uzbekistan, Radio Tashkent	7190as	9375as	9530as	9715as
0100	0145		Germany, Deutsche Welle	6040na	9640am	11810na	13720am
0100	0156		North Korea, Voice of Korea	3560va	11734va	15230va	17735va
0100	0159		Canada, R Canada International	5960am	13670am	13770am	15170am
				15305am			
0100	0200		Anguilla, Caribbean Beacon	6090am			
0100	0200	vl	Australia, ABC/Katherine	5025do			
0100	0200	vl	Australia, ABC/Tennant Creek	4910do			
0100	0200		Australia, Christian Voice	17775pa	21680pa		
0100	0200		Australia, Radio	9660pa	12080pa	15240as	15415as
				17580va	17750as	17795va	21725va
0100	0200		Canada, CBC Northern Service	9625do			
0100	0200		Canada, CFRX Toronto ON	6070do			
0100	0200		Canada, CFVP Calgary AB	6030do			
0100	0200		Canada, CHNX Halifax, NS	6130do			
0100	0200		Canada, CKZN St John's NF	6160do			
0100	0200		Canada, CKZU Vancouver BC	6160do			
0100	0200		China, China Radio International	9570na			
0100	0200		Costa Rica, R for Peace Intl	7450irr	15049va		
0100	0200		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na		
0100	0200		Cuba, Radio Havana	6000na	9820na	11705na	
0100	0200		Ecuador, HCJB	9745na	15115na	21455usb	
0100	0200	a/monthly	Finland, Scandv Weekend Radio	11720va			
0100	0200		Guyana, Voice of	3289do	5949do		
0100	0200		Indonesia, Voice of	9525as	11784as	15149as	
0100	0200		Japan, Radio	11860pa	11870me	11880me	15325as
				17685pa	17810as	17835sa	17845as
0100	0200		Malaysia, Radio	7295do			
0100	0200		Malaysia, RTM Kota Kinabalu	5980do			
0100	0200		Namibia, Namibian BC Corp	3270af	3289af		
0100	0200		New Zealand, R New Zealand Int	17675pa			
0100	0200		New Zealand, ZLXA	3935do	7290do		
0100	0200	vl	Papua New Guinea, NBC	9675do	11880irr		
0100	0200		Russia, Voice of Russia WS	9665na	9725na	11825na	12000na
				17595na			
0100	0200		Singapore, SBC Radio One	6150do			
0100	0200	vl/as	Solomon Islands, SIBC	5020do			
0100	0200	vl/a	Solomon Islands, SIBC	9545do			
0100	0200		Spain, R Exterior Espana	15385na			
0100	0200		Switzerland, Swiss R International	9885am			
0100	0200		UK, BBC World Service	5965as	5975am	6175na	6195as
				9410as	9590am	9915sa	11955as
				12095sa	15280as	15310as	15360as
				17790as			
0100	0200		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
0100	0200		USA, KAIJ Dallas TX	13815va			
0100	0200		USA, KJES Vado NM	7555na			
0100	0200		USA, KTBN Salt Lake City UT	7510na			
0100	0200		USA, KWHR Naalehu HI	17510as			
0100	0200		USA, Voice of America	7115as	9635as	11705as	11725as
				11820as	13650as	15250as	17740as
				17820as			
0100	0200	s twhfa	USA, WBCQ Monticello ME	9335na			
0100	0200		USA, WBCQ Monticello ME	7415na			
0100	0200		USA, WEWN Birmingham AL	5825na	13615na		
0100	0200		USA, WHRA Greenbush ME	7580eu			
0100	0200		USA, WHRI Noblesville IN	5745va	7315am		
0100	0200		USA, WINB Red Lion PA	12160am			
0100	0200		USA, WJCR Upton KY	7490am	13595as		
0100	0200	twhfa	USA, WRMI Miami FL	7385na			
0100	0200	sm	USA, WRMI Miami FL	9955am			
0100	0200		USA, WRNO New Orleans LA	7355va			
0100	0200		USA, WSHB Cypress Crk SC	7535na	9430am	15285sa	
0100	0200		USA, WTJC Newport NC	9370na			
0100	0200		USA, WWCR Nashville TN	3215na	5070na	7435na	13845na
0100	0200		USA, WWFV McCaysville GA	3270va	5085am		
0100	0200		USA, WYFR Okeechobee FL	6065na	9505na	15060as	
0100	0200	vl	Vanuatu, Radio	3945do	4960do	7260do	
0100	0200		Zambia, Christian Voice	4965do			
0130	0145	vl	Libya, Voice of Africa	11815af	15435af	17725af	
0130	0200		Austria, R Austria International	9870na			
0130	0200		Sweden, Radio	13625as			
0130	0200		UK, RTE Radio	6155ca			
0130	0200	twhfa	USA, VOA Special English	9775am	7405am	13740am	
0130	0200	twhfa	USA, Voice of America	5995am	6130am	9455am	
0140	0200		Vatican City, Vatican Radio	9650au	12055au		
0145	0200		Albania, R Tirana International	6115na	7160na		

SELECTED PROGRAMMING BEGINS ON PAGE 56

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0200 UTC - 10PM E / 9PM C / 7PM P

0200	0210		Bangladesh, Bangla Betar	4882as			
0200	0210	mtwhf	Greece, Voice of	7475va	9420va	11645va	12105va
0200	0230	sm w fa	Belarus, R Belarus International	6070eu	7210eu		
0200	0230		Myanmar, Radio	7185do			
0200	0230	a	UK, Wales Radio Intl/Merlin	9795na			
0200	0230		USA, KJES Vado NM	7555na			
0200	0230		USA, WINB Red Lion PA	12160am			
0200	0245		Germany, Deutsche Welle	11965as	13710as	15370as	
0200	0245		Iraq, Radio Iraq International	7157irr	9684irr	11785irr	
0200	0256		North Korea, Voice of Korea	11845va	13650va		
0200	0256		Romania, R Romania International	11940na	15105as	15180as	15340na
				17735as	17790pa		
0200	0257		Canada, R Canada International	15260as	17860as		
0200	0300		Anguilla, Caribbean Beacon	6090am			
0200	0300	twhfa	Argentina, RAE	11710am			
0200	0300	vl	Australia, ABC/Alice Springs	4835do			
0200	0300	vl	Australia, ABC/Katherine	5025do			
0200	0300	vl	Australia, ABC/Tennant Creek	4910do			
0200	0300		Australia, Christian Voice	17775pa	21680pa		
0200	0300		Australia, Radio	9660pa	12080pa	15240as	15415as
				15515va	17580va	17750as	21725va
0200	0300		Bulgaria, Radio	9400na	11700na		
0200	0300		Canada, CBC Northern Service	9625do			
0200	0300		Canada, CFRX Toronto ON	6070do			
0200	0300		Canada, CFVP Calgary AB	6030do			
0200	0300		Canada, CHNX Halifax, NS	6130do			
0200	0300		Canada, CKZN St John's NF	6160do			
0200	0300		Canada, CKZU Vancouver BC	6160do			
0200	0300		Costa Rica, R for Peace Intl	7450irr	15049va		
0200	0300		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	13749na	
0200	0300		Cuba, Radio Havana	6000na	9820na	11705na	
0200	0300		Ecuador, HCJB	9745na	15115na	21455usb	
0200	0300		Egypt, Radio Cairo	9475am			
0200	0300	a/monthly	Finland, Scandv Weekend Radio	11720va			
0200	0300		Guyana, Voice of	3289do	5949do		
0200	0300		Kenya, Kenya BC Corp	4935do			
0200	0300		Malaysia, Radio	7295do			
0200	0300		Malaysia, RTM Kota Kinabalu	5980do			
0200	0300		Namibia, Namibian BC Corp	3270af	3289af		
0200	0300		New Zealand, R New Zealand Int	17675pa			
0200	0300		New Zealand, ZLXA	3935do	7290do		
0200	0300	vl	Papua New Guinea, NBC	9675do	11880irr		
0200	0300		Russia, Voice of Russia WS	9665na	12000na	17595na	
0200	0300		Singapore, SBC Radio One	6150do			
0200	0300	vl/as	Solomon Islands, SIBC	5020do			
0200	0300	vl/a	Solomon Islands, SIBC	9545do			
0200	0300		South Korea, R Korea Intl	7275na	11725sa	11810sa	15575na
0200	0300		Sri Lanka, Sri Lanka BC Corp	6005as	6075as	6130do	9770as
				15425as			
0200	0300		Taiwan, Radio Taipei International	5950na	9680na	11740am	11825pa
				15345as			
0200	0300		UK, BBC World Service	5975am	6135am	6175na	6195eu
				9410eu	9770af	9915sa	11955as
				12095va	15280as	15310as	15360as
				17790as			
0200	0300		UK, Merlin Network One	9430na			
0200	0300		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
0200	0300		USA, KAIJ Dallas TX	5755va			
0200	0300		USA, KTBN Salt Lake City UT	7510na			
0200	0300		USA, KWHR Naalehu HI	17510as			
0200	0300		USA, Voice of America	7115as	9635as	11705as	11725as
				11820as	13650as	15250as	17740as
				17820as			
0200	0300		USA, WBCQ Monticello ME	7415na			
0200	0300	s twhfa	USA, WBCQ Monticello ME	9335na			
0200	0300		USA, WEWN Birmingham AL	5825na			
0200	0300		USA, WHRA Greenbush ME	7580eu			
0200	0300		USA, WHRI Noblesville IN	5745va	7315am		
0200	0300		USA, WJCR Upton KY	7490am	13595as		
0200	0300		USA, WRMI Miami FL	7385na			
0200	0300		USA, WRNO New Orleans LA	7355va			
0200	0300		USA, WSHB Cypress Crk SC	5850na	7535am	9430na	
0200	0300		USA, WTJC Newport NC	9370na			
0200	0300		USA, WWCR Nashville TN	3215na	5070na	5935na	7435na
0200	0300		USA, WWFV McCaysville GA	3270va	5085am		
0200	0300		USA, WYFR Okeechobee FL	6065na	9505na		
0200	0300	vl	Vanuatu, Radio	3945do	4960do	7260do	
0200	0300		Zambia, Christian Voice	4965do			
0200	1215		Cambodia, National Radio Of	11940as			
0215	0220		Nepal, Radio	5005as	7165as		
0230	0257		Vietnam, Voice of	9525na			
0230	0300		Albania, R Tirana International	6115na	7160na		
0230	0300		Hungary, Radio Budapest	9570na			
0230	0300		Philippines, Radyo Pilipinas	11885pa	15120pa	15270pa	
0230	0300		Slovakia, Adventist World Radio	7235as			
0230	0300		Sweden, Radio	9495am	9755na		
0230	0300		Switzerland, Swiss R International	9885am			
0250	0300		Vatican City, Vatican Radio	7305am	9605am		
0250	0300	vl	Zambia, National BC Corp	6165do	6265do		

0300 UTC - 11PM E / 10PM C / 8PM P

0300	0310		Vatican City, Vatican Radio	7305am	9605am		
0300	0327		Czech Rep, Radio Prague Intl	7345na	7385na	9870na	
0300	0330		Egypt, Radio Cairo	9475am			
0300	0330		S Africa, Channel Africa	6035af			
0300	0330		Thailand, Radio	9655am	11905am	15395na	
0300	0330	s twhfa	USA, WBCQ Monticello ME	9335na			
0300	0345		Germany, Deutsche Welle	9535na	9640na	13780am	15105na
0300	0400		Anguilla, Caribbean Beacon	6090am			
0300	0400	vl	Australia, ABC/Alice Springs	4835do			
0300	0400	vl	Australia, ABC/Katherine	5025do			
0300	0400	vl	Australia, ABC/Tennant Creek	4910do			
0300	0400		Australia, Christian Voice	21680pa			
0300	0400		Australia, Radio	9660pa	12080pa	15240as	15415as
				15515va	17580va	17750as	21725va
0300	0400	mtwhf	Bhutan, Bhutan BC Service	6035do			
0300	0400	vl	Botswana, Radio	3356do	4820do	7255do	
0300	0400		Canada, CBC Northern Service	9625do			
0300	0400		Canada, CFRX Toronto ON	6070do			
0300	0400		Canada, CFVP Calgary AB	6030do			
0300	0400		Canada, CHNX Halifax, NS	6130do			
0300	0400		Canada, CKZN St John's NF	6160do			
0300	0400		Canada, CKZU Vancouver BC	6160do			
0300	0400		China China Radio International	9690na			
0300	0400		Costa Rica, Faro del Caribe	5054ca	6175ca	9644ca	
0300	0400		Costa Rica, R for Peace Intl	7450irr	15049va		
0300	0400		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	17645as	
0300	0400		Cuba, Radio Havana	6000na	9820na	11705na	
0300	0400		Ecuador, HCJB	9745na	15115na	21455usb	
0300	0400	a/monthly	Finland, Scandv Weekend Radio	11720va			
0300	0400	vl	Guatemala, Radio Cultural	3300do	5955do		
0300	0400		Guyana, Voice of	3289do	5949do		
0300	0400	sm	Honduras, Radio Luz y Vida	3250ca			
0300	0400		Japan, Radio	17825ca	21610pa		
0300	0400		Kenya, Kenya BC Corp	4935do			
0300	0400	vl	Lesotho, Radio	4800do			
0300	0400		Malaysia, Radio	7295do			
0300	0400		Malaysia, Voice of Islam	6175as	9750as	15295as	
0300	0400		Namibia, Namibian BC Corp	3270af	3289af		
0300	0400		New Zealand, R New Zealand Int	17675pa			
0300	0400		Oman, Radio Sultanate of	15355va			
0300	0400	vl	Papua New Guinea, NBC	9675do	11880irr		
0300	0400		Philippines, Radyo Pilipinas	11885		15120pa	15270pa
0300	0400		Russia, Voice of Russia WS	9665na	11750na	12000na	17565na
				17650na	17660na	17690na	
0300	0400		Singapore, SBC Radio One	6150do			
0300	0400	vl/as	Solomon Islands, SIBC	5020do			
0300	0400	vl/a	Solomon Islands, SIBC	9545do			
0300	0400		Sri Lanka, Sri Lanka BC Corp	6005as	6075as	6130do	9770as
				15425as			
0300	0400		Taiwan, Radio Taipei International	5950na	9680na	11745as	11825as
0300	0400		Turkey, Voice of	7270af	11655va	21715as	
0300	0400		Uganda, Radio	4976do	5026do		
0300	0400		UK, BBC World Service	3255af	5975am	6005af	6135am
				6175na	6190af	6195eu	7120af
				7160af	9410eu	11730af	12035af
				12095me	15280as	15310as	15360as
				15420af	15575me	17760as	17790as
				21660as	21830as		
0300	0400		Ukraine, R Ukraine International	7320eu	7410eu	9640eu	11840eu
				13590na			
0300	0400		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
0300	0400		USA, KAIJ Dallas TX	5755va			
0300	0400		USA, KTBN Salt Lake City UT	7510na			
0300	0400		USA, KWHR Naalehu HI	17510as			
0300	0400		USA, Voice of America	5855af	6080af	7105af	7275af
				7290af	7340af	9575af	9885af
				17895af			
0300	0400		USA, WBCQ Monticello ME	7415na			
0300	0400		USA, WEWN Birmingham AL	5825na			
0300	0400		USA, WHRA Greenbush ME	7580eu			
0300	0400		USA, WHRI Noblesville IN	5745va	7315am		
0300	0400	s	USA, WINB, Red Lion PA	12160am			
0300	0400		USA, WJCR Upton KY	7490am	13595as		
0300	0400		USA, WMLK Bethel PA	9465eu			
0300	0400		USA, WRMI Miami FL	7385na			
0300	0400		USA, WRNO New Orleans LA	7395am			
0300	0400		USA, WSHB Cypress Crk SC	5850na	11930eu		
0300	0400		USA, WTJC Newport NC	9370na			
0300	0400		USA, WWCR Nashville TN	3215na	5070na	5935na	7435na
0300	0400		USA, WWFV McCaysville GA	3270va	5085am		
0300	0400		USA, WYFR Okeechobee FL	6065na	9505na		
0300	0400	vl	Vanuatu, Radio	3945do	4960do	7260do	
0300	0400		Zambia, Christian Voice	6065do			
0300	0400	vl	Zambia, National BC Corp	6165do	6265do		
0300	0400	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
0310	0315		Vatican City, Vatican Radio	7305am	9605am	9660af	
0315	0340		Vatican City, Vatican Radio	9660af			
0330	0345	vl	Libya, Voice of Africa	11815af	15435af	17725af	
0330	0357		Czech Rep, Radio Prague Intl	11600as	15470as		
0330	0357		Vietnam, Voice of	9795na			

0330	0400		Austria, AWR Europe	17635as			
0330	0400		Myanmar, Radio	9730do			
0330	0400		Sweden, Radio	11895na	15245na		
0330	0400		UAE, Radio Dubai	11725na	12005na	13675na	15400na
0330	0400	twhfa	USA, WBCQ Monticello ME	9335na			
0345	0400	f	Seychelles, FEBA Radio	11885af			

0400 UTC - 12AM E / 11PM C / 9PM P

0400	0405		USA, WWCR Nashville TN	5070na	5935na	7435na	
0400	0405	sm	USA, WWCR Nashville TN	3210na			
0400	0405	twhfa	USA, WWCR Nashville TN	3215na			
0400	0415		Israel, Kol Israel	9435va	15640va	17545va	
0400	0430		Belgium, RVI Flanders R Intl	15595na			
0400	0430		France R France International	15155af			
0400	0430	s twhfa	Mexico, R Mexico International	9705am	11770am		
0400	0430	vl	Nigeria, Radio/Kaduna	6090do	7275do		
0400	0430		S Africa, Channel Africa	5955af			
0400	0430		Sri Lanka, Sri Lanka BC Corp	6005as	6075as	6130do	9770as
				15425as			
0400	0430		Switzerland, Swiss R International	9610eu	9885am		
0400	0430		USA, WRMI Miami FL	7385na			
0400	0445		Germany, Deutsche Welle	7225af	9565af	9765af	13690af
0400	0455		USA, WYFR Okeechobee FL	6065na	9355eu	9505na	
0400	0456		China China Radio International	9560na	9730na		
0400	0456		Romania, R Romania International	11940na	15365na	15365na	17735as
				21480as			
0400	0458		New Zealand, R New Zealand Int	17675pa			
0400	0500		Anguilla, Caribbean Beacon	6090am			
0400	0500	vl	Australia, ABC/Alice Springs	4835do			
0400	0500	vl	Australia, ABC/Katherine	5025do			
0400	0500	vl	Australia, ABC/Tennant Creek	4910do			
0400	0500		Australia, Christian Voice	21680pa			
0400	0500		Australia, Radio	9660pa	12080pa	15240as	15415as
				15515va	17580va	17750as	21725va
0400	0500	vl	Botswana, Radio	3356do	4820do	7255do	
0400	0500		Canada, CBC Northern Service	9625do			
0400	0500		Canada, CFRX Toronto ON	6070do			
0400	0500		Canada, CFVP Calgary AB	6030do			
0400	0500		Canada, CHNX Halifax, NS	6130do			
0400	0500		Canada, CKZN St John's NF	6160do			
0400	0500		Canada, CKZU Vancouver BC	6160do			
0400	0500		Costa Rica, R for Peace Intl	7450irr	15049va		
0400	0500		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	17645as	
0400	0500		Cuba, Radio Havana	6000na	9820na	11705na	
0400	0500		Ecuador, HCJB	9745na	15115na	21455usb	
0400	0500	a/monthly	Finland, Scandv Weekend Radio	11720va			
0400	0500	vl	Guatemala, Radio Cultural	3300do	5955do		
0400	0500		Guyana, Voice of	3289do	5949do		
0400	0500		Kenya, Kenya BC Corp	4935do			
0400	0500	vl	Lesotho, Radio	4800do			
0400	0500		Malaysia, Radio	7295do			
0400	0500		Malaysia, Voice of Islam	6175as	9750as	15295as	
0400	0500		Myanmar, Radio	9730do			
0400	0500		Namibia, Namibian BC Corp	3270af	3289af		
0400	0500		New Zealand, ZLXA	3935do	7290do		
0400	0500	vl	Nigeria, Radio/Enugu	6025do			
0400	0500	vl	Papua New Guinea, NBC	9675do	11880irr		
0400	0500		Russia, Voice of Russia WS	9665na	11750na	12000na	17565na
				17650na	17690na		
0400	0500		Singapore, SBC Radio One	6150do			
0400	0500	vl/as	Solomon Islands, SIBC	5020do			
0400	0500	vl/a	Solomon Islands, SIBC	9545do			
0400	0500		Uganda, Radio	4976do	5026do		
0400	0500		UK, BBC World Service	3255af	5975am	6005af	6135am
				6175na	6190af	6195eu	7120af
				7160af	9410eu	12035eu	12095me
				15280as	15310as	15420af	15575me
				17640af	17760as	17790as	21660as
				21830as			
0400	0500		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
0400	0500		USA, KAIJ Dallas TX	5755va			
0400	0500		USA, KTBN Salt Lake City UT	7510na			
0400	0500		USA, KWHR Naalehu HI	17780as			
0400	0500		USA, Voice of America	4960af	5855af	6080af	7275af
				7290af	9530va	9575af	11965me
				15205va	17895af		
0400	0500		USA, WBCQ Monticello ME	7415na			
0400	0500		USA, WEWN Birmingham AL	5825na			
0400	0500		USA, WHRA Greenbush ME	7580eu			
0400	0500		USA, WHRI Noblesville IN	5745va	7315am		
0400	0500		USA, WJCR Upton KY	7490am	13595as		
0400	0500		USA, WMLK Bethel PA	9465eu			
0400	0500		USA, WSHB Cypress Crk SC	11930eu	15195af		
0400	0500		USA, WTJC Newport NC	9370na			
0400	0500		USA, WWFV McCaysville GA	3270va	5085am		
0400	0500		Zambia, Christian Voice	6065do			
0400	0500	vl	Zambia, National BC Corp	6165do	6265do		
0400	0500	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
0405	0500		USA, WWCR Nashville TN	3210na	5070na	5935na	7435na
0425	0440		Italy, RAI International	5975af	7150af		
0427	0525	a	Liberia, Voice of Hope	12060af	15320af		
0430	0500		Italy, Italian Radio Relay Service	3985va			
0430	0500		Netherlands, Radio	6165na	9590na		
0430	0500	vl	Nigeria, Radio/Ibadan	6050do			
0430	0500	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0430	0500	vl	Nigeria, Radio/Lagos	3326do	4990do		
0430	0500		S Africa, Adv World Radio Africa	11975af			
0430	0500		Sri Lanka, Sri Lanka BC Corp	6130do			
0430	0500	mtwhfa	Swaziland, Trans World Radio	3200af	4775af		
0430	0500		Switzerland, Swiss R International	9885am			
0430	0500	s twhfa	USA, WRMI Miami FL	7385na			
0445	0500		USA, WYFR Okeechobee FL	9355eu			
0459	0500		New Zealand, R New Zealand Int	15120pa			

0500 UTC - 1AM E / 12AM C / 10PM P

0500	0504		Pakistan, Radio	15180me	17835me	21460me	
0500	0515		Canada, CBC Northern Service	9625do			
0500	0515	s hfa	USA, KVOH Los Angeles CA	9975na			
0500	0520		Vatican City, Vatican Radio	4005eu	5885eu	7250eu	9660af
				11625af	15570af		
0500	0530		Canada, R Canada International	6145eu	7290eu	9595eu	11710eu
				13755af	15330af	17740af	
0500	0530		France R France International	17800af			
0500	0530	s twhfa	Mexico, R Mexico International	9705am	11770am		
0500	0530		Netherlands, Radio	6165na	9845na		
0500	0530		S Africa, Adv World Radio Africa	5960af	6015af		
0500	0530		S Africa, Channel Africa	11720af			
0500	0530		Switzerland, Swiss R International	9610eu			
0500	0530		Uganda, Radio	4976do	5026do		
0500	0530		UK, BBC World Service	5975am	6005af	6175am	6190af
				6195eu	7160af	9410eu	9740as
				11760me	11765af	11940af	11955pa
				12095eu	15280as	15310as	15360as
				15420af	15575as	17640af	17760as
				17790as	17885af	21660as	
0500	0530	s twhfa	USA, WRMi Miami FL	7385na			
0500	0530	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
0500	0545		Germany, Deutsche Welle	9690na	9785na	11985na	
0500	0600		Anguilla, Caribbean Beacon	6090am			
0500	0600	vl	Australia, ABC/Alice Springs	4835do			
0500	0600	vl	Australia, ABC/Katherine	5025do			
0500	0600	vl	Australia, ABC/Tennant Creek	4910do			
0500	0600		Australia, Christian Voice	21680pa			
0500	0600		Australia, Radio	9660pa	12080pa	15240as	15515va
				17580va	21725va		
0500	0600	vl	Botswana, Radio	3356do	4820do	7255do	
0500	0600		Canada, CFRX Toronto ON	6070do			
0500	0600		Canada, CFVP Calgary AB	6030do			
0500	0600		Canada, CHNX Halifax, NS	6130do			
0500	0600		Canada, CKZN St John's NF	6160do			
0500	0600		Canada, CKZU Vancouver BC	6160do			
0500	0600		Costa Rica, R for Peace Intl	7450irr	15049va		
0500	0600		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	17645as	
0500	0600		Cuba, Radio Havana	9550na	9820na	9830na	
0500	0600		Ecuador, HCJB	9745na	15115na	21455usb	
0500	0600	a/monthly	Finland, Scandv Weekend Radio	11720va			
0500	0600		Guyana, Voice of	3289do	5949do		
0500	0600		Italy, Italian Radio Relay Service	3985va			
0500	0600		Japan, Radio	5975eu	6110na	7230eu	11715as
				11760as	13630na	15195as	17810pa
				21755pa			
0500	0600		Kenya, Kenya BC Corp	4935do			
0500	0600		Kuwait, Radio	15110as			
0500	0600	vl	Lesotho, Radio	4800do			
0500	0600	vl	Liberia, R Liberia International	5100do			
0500	0600		Malaysia, Radio	7295do			
0500	0600		Malaysia, RTM Sarawak	7160do			
0500	0600		Malaysia, Voice of Islam	6175as	9750as	15295as	
0500	0600		Myanmar, Radio	9730do			
0500	0600		Namibia, Namibian BC Corp	3270af	3289af		
0500	0600		New Zealand, R New Zealand Int	15120pa			
0500	0600		New Zealand, ZLXA	3935do	7290do		
0500	0600	vl	Nigeria, Radio/Enugu	6025do			
0500	0600	vl	Nigeria, Radio/Ibadan	6050do			
0500	0600	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0500	0600	vl	Nigeria, Radio/Lagos	3326do	4990do		
0500	0600	vl	Nigeria, Voice of	7255af	15120af		
0500	0600	vl	Papua New Guinea, NBC	9675do	11880irr		
0500	0600		Russia, Voice of Russia WS	17635au	17685au	21790au	
0500	0600		Singapore, SBC Radio One	6150do			
0500	0600	vl	Solomon Islands, SIBC	5020do	9545do		
0500	0600		Spain, R Exterior Espana	6055na			
0500	0600		Sri Lanka, Sri Lanka BC Corp	6130do			
0500	0600		Swaziland, Trans World Radio	4775af	6035af	9500af	
0500	0600		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
0500	0600		USA, KAIJ Dallas TX	5755va			
0500	0600		USA, KTBN Salt Lake City UT	7510na			
0500	0600		USA, KWHR Naalehu HI	11565pa	17780as		
0500	0600		USA, Voice of America	5970af	6035af	6080af	7195af
				9530va	11965me	12080af	13670af
				15205va			
0500	0600		USA, WBCQ Monticello ME	7415na			

0500	0600		USA, WEWN Birmingham AL	5825na			
0500	0600		USA, WHRA Greenbush ME	11730af			
0500	0600		USA, WHRI Noblesville IN	5745va	7315am		
0500	0600		USA, WJCR Upton KY	7490am	13595as		
0500	0600		USA, WMLK Bethel PA	9465eu			
0500	0600		USA, WRNO New Orleans LA	7395am			
0500	0600		USA, WSHB Cypress Crk SC	9840af	11930eu		
0500	0600		USA, WTJC Newport NC	9370na			
0500	0600		USA, WWCR Nashville TN	3210na	5070na	5935na	7435na
0500	0600		USA, WYFR Okeechobee FL	5985na	9355eu	11580eu	
0500	0600	vl	Vanuatu, Radio	3945do	4960do	7260do	
0500	0600		Zambia, Christian Voice	6065do			
0500	0600	vl	Zambia, National BC Corp	6165do	6265do		
0515	0530	h a	USA, KVOH Los Angeles CA	9975na			
0520	0530		Vatican City, Vatican Radio	9660af	11625af	15570af	
0525	0600	vl	Ghana, Ghana BC Corp	3366do	4915do		
0530	0540	vl	Cameroon, CRTV Radio Buea	6005do			
0530	0545	ma	USA, KVOH Los Angeles CA	9975na			
0530	0559		Canada, R Canada International	13755af	15330af	17740af	
0530	0600		Georgia, Georgian Radio	11805eu			
0530	0600		S Africa, Adv World Radio Africa	11970af			
0530	0600		Thailand, Radio	9655eu	11905eu	21795eu	
0530	0600		UAE, Radio Dubai	13675au	15435au	17830au	21700au
0530	0600	smtwhf	UK, BBC World Service	17885af			
0530	0600	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
0532	0600		Austria, R Austria International	6155eu	13730eu		
0545	0600	ma	USA, KVOH Los Angeles CA	9975na			

0600 UTC - 2AM E / 1AM C / 11PM P

0600	0615		S Africa, Trans World Radio	11640af			
0600	0615		USA, WBCQ Monticello ME	7415na			
0600	0630		France R France International	17800af	21620as		
0600	0630	mtwhfa	Malta, Voice of Mediterranean	7150eu			
0600	0630		S Africa, Channel Africa	15215af			
0600	0630		USA, Voice of America	5970af	6035af	6080af	7195af
				9530va	9680af	11805af	11965me
				11995af	12080af	13670af	15205va
0600	0641		Romania, R Romania International	11940na	15180na		
0600	0645		Germany, Deutsche Welle	6140eu	11925af	13790af	17860af
0600	0700		Anguilla, Caribbean Beacon	6090am			
0600	0700	vl	Australia, ABC/Alice Springs	4835do			
0600	0700	vl	Australia, ABC/Katherine	5025do			
0600	0700	vl	Australia, ABC/Tennant Creek	4910do			
0600	0700		Australia, Christian Voice	21680pa			
0600	0700		Australia, Radio	9660pa	12080pa	15240as	15415as
				15515va	17580va	17750as	21725va
0600	0700	vl	Botswana, Radio	7255do	9600do	7255do	
0600	0700		Canada, CFRX Toronto ON	6070do			
0600	0700		Canada, CFVP Calgary AB	6030do			
0600	0700		Canada, CHNX Halifax, NS	6130do			
0600	0700		Canada, CKZN St John's NF	6160do			
0600	0700		Canada, CKZU Vancouver BC	6160do			
0600	0700		Costa Rica, R for Peace Intl	7450irr	15049va		
0600	0700		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	17645as	
0600	0700		Cuba, Radio Havana	9550na	9820na	9830na	
0600	0700		Ecuador, HCJB	9745na	11680eu	15115na	21455usb
0600	0700	a/monthly	Finland, Scandv Weekend Radio	11690va			
0600	0700		Germany, Overcomer Ministries	9430pa	13810au		
0600	0700	vl	Ghana, Ghana BC Corp	3366do	4915do		
0600	0700		Guyana, Voice of	3289do	5949do		
0600	0700	mtwhf/vl	Italy, Italian Radio Relay Service	7120va			
0600	0700		Japan, Radio	7230eu	11740pa	13630pa	15195as
				17870pa	21755pa		
0600	0700		Kenya, Kenya BC Corp	4935do			
0600	0700		Kuwait, Radio	15110as			
0600	0700	vl	Lesotho, Radio	4800do			
0600	0700	vl	Liberia, ELWA	4760do			
0600	0700	vl	Liberia, R Liberia International	5100do			
0600	0700		Malaysia, Radio	7295do			
0600	0700		Malaysia, RTM Sarawak	7160do			
0600	0700		Malaysia, Voice of	6175as	9750as	15295as	
0600	0700		Myanmar, Radio	9730do			
0600	0700		Namibia, Namibian BC Corp	3270af	3289af		
0600	0700		New Zealand, ZLXA	3935do	7290do		
0600	0700	vl	Nigeria, Radio/Enugu	6025do			
0600	0700	vl	Nigeria, Radio/Ibadan	6050do			
0600	0700	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0600	0700	vl	Nigeria, Radio/Lagos	3326do	4990do		
0600	0700	vl	Nigeria, Voice of	7255af	15120af		
0600	0700	vl	Papua New Guinea, NBC	9675do	11880irr		
0600	0700		Russia, Voice of Russia WS	15490au	17635au	17685au	21790au
0600	0700		Sierra Leone, Sierra Leone BS	3316do			
0600	0700		Singapore, SBC Radio One	6150do			
0600	0700	vl	Solomon Islands, SIBC	5020do	9545do		
0600	0700		Sri Lanka, Sri Lanka BC Corp	6130do			
0600	0700		Swaziland, Trans World Radio	4775af	6035af	9500af	
0600	0700		Uganda, Radio	5026do	7110do	7196do	
0600	0700		UK, BBC World Service	6055af	6175am	6190af	6195eu
				7160af	9410eu	9580pa	9740as
				11760me	11765af	11940af	11955pa
				12095eu	15310as	15360as	15485eu
				15565eu	17640af	17760as	17790as
				21660as			
0600	0700	asUK, BBC World Service		17885af			
0600	0700		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
0600	0700		USA, KAIJ Dallas TX	5755va			
0600	0700		USA, KTBN Salt Lake City UT	7510na			
0600	0700		USA, KWHR Naalehu HI	11565pa	17780as		
0600	0700		USA, WEWN Birmingham AL	5825na			
0600	0700		USA, WHRA Greenbush ME	11730af			
0600	0700		USA, WHRI Noblesville IN	5745va	7315am		
0600	0700		USA, WJCR Upton KY	7490am	13595as		
0600	0700		USA, WMLK Bethel PA	9465eu			
0600	0700		USA, WRNO New Orleans LA	7395am			
0600	0700		USA, WSHB Cypress Crk SC	11615af	13650af		
0600	0700		USA, WTJC Newport NC	9370na			
0600	0700		USA, WWCR Nashville TN	3210na	5070na	5935na	7435na
0600	0700		USA, WYFR Okeechobee FL	5985na	7355eu		
0600	0700	vl	Vanuatu, Radio	3945do	4960do	7260do	
0600	0700		Yemen, Rep of Yemen Radio	9780me			
0600	0700		Zambia, Christian Voice	9865do			
0600	0700	vl	Zambia, National BC Corp	6165do	6265do		
0600	0700	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
0605	0610	mtwhfa	Croatia, Croatian Radio	6165eu	7365eu	9830eu	9724sa
				11870am	13749na	17645as	
0610	0615	mtwhf	Vatican City, Vatican Radio	4005eu	5885eu	7250eu	9645eu
				11740eu	15595eu		
0610	0620	mtwhf	Greece, Voice of	9420eu	11900au	15630eu	17520pa
				21530eu			
0630	0640	vl	Cameroon, CRTV Radio Buea	6005do			
0630	0700		Finland, YLE/Radio Finland	15315va	21670va		
0630	0700	t h	Georgia, Georgian Radio	6080me			
0630	0700		USA, Voice of America	9530va	9680af	11805af	11965me
				15205va			
0630	0700	as	USA, Voice of America	5970af	6035af	6080af	7195af
				11995af	12080af	13670af	
0630	0700		Vatican City, Vatican Radio	11625af	13765af	15570af	
0641	0656		Romania, R Romania International	11775eu	11940na	15180na	15365eu
0645	0655	as	Monaco, Trans World Radio	9870eu			
0645	0700		Germany, Deutsche Welle	6140eu			
0655	0700		Monaco, Trans World Radio	9870eu			

0700 UTC - 3AM E / 2AM C / 12AM P

0700	0705		New Zealand, R New Zealand Int	15120pa			
0700	0720		Swaziland, Trans World Radio	4775af	6035af	9500af	
0700	0727		Czech Rep, Radio Prague Intl	9880eu	11600eu		
0700	0730		Belgium, RVI Flanders R Intl	9865eu			
0700	0730	vl	Papua New Guinea, NBC	9675do	11880irr		
0700	0730		Slovakia, R Slovakia International	9440au	15460au	17550au	
0700	0730	as	UK, BBC World Service	17885af			
0700	0730	a	USA, Voice of America	6873va			
0700	0756		Romania, R Romania International	17735pa			
0700	0800		Anguilla, Caribbean Beacon	6090am			
0700	0800	vl	Australia, ABC/Alice Springs	4835do			
0700	0800	vl	Australia, ABC/Katherine	5025do			
0700	0800	vl	Australia, ABC/Tennant Creek	4910do			
0700	0800		Australia, Christian Voice	17870as	21680pa		
0700	0800		Australia, Radio	9660pa	12080pa	15240va	15415as
				17580va	17750as	21725va	
0700	0800	vl	Botswana, Radio	7255do	9600do	7255do	
0700	0800		Canada, CFRX Toronto ON	6070do			
0700	0800		Canada, CFVP Calgary AB	6030do			
0700	0800		Canada, CHNX Halifax, NS	6130do			
0700	0800		Canada, CKZN St John's NF	6160do			
0700	0800		Canada, CKZU Vancouver BC	6160do			
0700	0800		Costa Rica, R for Peace Intl	7450irr	15049va		
0700	0800		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	17645as	
0700	0800		Ecuador, HCJB	11680eu	11755pa	21455usb	
0700	0800	mtwhf	Eqt Guinea, Radio Africa	15185af			
0700	0800	as/vl	Eqt. Guinea, Radio East Africa	15185af			
0700	0800	a/monthly	Finland, Scandv Weekend Radio	11690va			
0700	0800		France R France International	15605af			
0700	0800		Germany, Deutsche Welle	6140eu			
0700	0800		Germany, Overcomer Ministries	9430pa	13810au		
0700	0800	as	Germany, Trans World Radio	12070eu			
0700	0800		Germany, Voice of Hope	5975eu	21590me		
0700	0800	vl	Ghana, Ghana BC Corp	3366do	4915do		
0700	0800	vl	Ghana, Ghana BC Corp	3366do	4915do		
0700	0800		Guyana, Voice of	3289do	5949do		
0700	0800	as/vl	Italy, Italian Radio Relay Service	7120va			
0700	0800		Kenya, Kenya BC Corp	4935do			
0700	0800		Kuwait, Radio	15110as			
0700	0800	vl	Lesotho, Radio	4800do			
0700	0800	vl	Liberia, ELWA	4760do			
0700	0800	vl	Liberia, R Liberia International	5100do			
0700	0800		Malaysia, Radio	7295do			
0700	0800		Malaysia, RTM Sarawak	7160do			
0700	0800		Malaysia, Voice of	6275as	9750as	15295as	
0700	0800		Monaco, Trans World Radio	9870eu			
0700	0800		Myanmar, Radio	9730do			
0700	0800		Namibia, Namibian BC Corp	3270af	3289af		
0700	0800		New Zealand, ZLXA	3935do	7290do		
0700	0800	vl	Nigeria, Radio/Enugu	6025do			
0700	0800	vl	Nigeria, Radio/Ibadan	6050do			
0700	0800	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0700	0800	vl	Nigeria, Radio/Lagos	3326do	4990do		

0700	0800		Russia, Voice of Russia WS	15490au	17495au	17525au	17635au
				17685au			
0700	0800		Sierra Leone, Sierra Leone BS	3316do			
0700	0800		Singapore, SBC Radio One	6150do			
0700	0800	vl	Solomon Islands, SIBC	5020do	9545do		
0700	0800		Sri Lanka, Sri Lanka BC Corp	6130do			
0700	0800		Taiwan, Radio Taipei International	5950na			
0700	0800		Uganda, Radio	5026do	7110do	7196do	
0700	0800		UK, BBC World Service	6175na	6190af	9410eu	9580pa
				9740as	11760me	11765af	11940af
				11955pa	12095eu	15310as	15360as
				15400af	15485eu	15565eu	15575as
				17640eu	17760as	17790as	17830af
				21660as			
0700	0800		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
0700	0800		USA, KAIJ Dallas TX	5755va			
0700	0800		USA, KTBN Salt Lake City UT	7510na			
0700	0800		USA, KWHR Naalehu HI	11565pa	17780as		
0700	0800		USA, WEWN Birmingham AL	5825na			
0700	0800		USA, WHRA Greenbush ME	11730af			
0700	0800		USA, WHRI Noblesville IN	5745va	7315am		
0700	0800		USA, WJCR Upton KY	7490am	13595as		
0700	0800		USA, WMLK Bethel PA	9465eu			
0700	0800		USA, WRNO New Orleans LA	7395am			
0700	0800		USA, WSHB Cypress Crk SC	11615af	13650af		
0700	0800		USA, WTJC Newport NC	9370na			
0700	0800		USA, WWCR Nashville TN	3210na	5070na	5935na	7435na
0700	0800		USA, WYFR Okeechobee FL	7355eu	13695af	15170af	
0700	0800	vl	Vanuatu, Radio	3945do	4960do	7260do	
0700	0800		Zambia, Christian Voice	9865do			
0700	0800	vl	Zambia, National BC Corp	6165do	6265do		
0700	0800	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
0705	0710	s	Croatia, Croatian Radio	6165eu	7365eu	9830eu	13830eu
0706	0800		New Zealand, R New Zealand Int	11720pa			
0715	0800		Guam, KTWR/ Trans World R	15200as			
0720	0735	mtwhf	Swaziland, Trans World Radio	4775af	6035af	9500af	
0730	0800		Georgia, Georgian Radio	11910eu			
0730	0800	vl	Papua New Guinea, NBC	4890do	9675irr		
0730	0800		Switzerland, Swiss R International	15545af	17685af	21750af	
0730	0800	as	UK, BBC World Service	15575as	17885af		
0750	0755	as	Greece, Voice of	9420eu	11900au	15630eu	17520as
21530as							
0755	0800	mtwhf	Germany, Trans World Radio	12070eu			

0800 UTC - 4AM E / 3AM C / 1AM P

0800	0804		Pakistan, Radio	17520eu	21465eu		
0800	0815		Guam, KTWR/ Trans World R	15200as			
0800	0820		Monaco, Trans World Radio	9870eu			
0800	0825		Malaysia, Voice of	6275as	9750as	15295as	
0800	0830	vl	Australia, ABC/Alice Springs	4835do			
0800	0830	vl	Australia, ABC/Katherine	5025do			
0800	0830	vl	Australia, ABC/Tennant Creek	4910do			
0800	0830		Myanmar, Radio	9730do			
0800	0900		Anguilla, Caribbean Beacon	6090am			
0800	0900		Australia, Christian Voice	17820as	21680pa		
0800	0900		Australia, Radio	5995pa	9580va	9710as	12080pa
				13605va	15125as	15415as	17750as
				21725va			
0800	0900	mtwhf	Bhutan, Bhutan BC Service	6035do			
0800	0900	vl	Botswana, Radio	7255do	9600do	7255do	
0800	0900		Canada, CFRX Toronto ON	6070do			
0800	0900		Canada, CFVP Calgary AB	6030do			
0800	0900		Canada, CHNX Halifax, NS	6130do			
0800	0900		Canada, CKZN St John's NF	6160do			
0800	0900		Canada, CKZU Vancouver BC	6160do			
0800	0900		Costa Rica, R for Peace Intl	15049irr	15049va		
0800	0900		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	17645as	
0800	0900		Ecuador, HCJB	11755pa	21455usb		
0800	0900	mtwhf	Eqt Guinea, Radio Africa	15185af			
0800	0900	as/vl	Eqt. Guinea, Radio East Africa	15185af			
0800	0900	a/monthly	Finland, Scandv Weekend Radio	11690va			
0800	0900		Germany, Deutsche Welle	6140eu			
0800	0900		Germany, Overcomer Ministries	13800pa	13810au		
0800	0900		Germany, Trans World Radio	12070eu			
0800	0900		Germany, Voice of Hope	5975eu	21590me		
0800	0900	vl	Ghana, Ghana BC Corp	3366do	4915do		
0800	0900		Guyana, Voice of	3289do	5949do		
0800	0900		Indonesia, Voice of	9525pa	11784pa	15149pa	
0800	0900	as/vl	Italy, Italian Radio Relay Service	7120va			
0800	0900		Kenya, Kenya BC Corp	4935do			
0800	0900	vl	Lesotho, Radio	4800do			
0800	0900	vl	Liberia, ELWA	4760do			
0800	0900	vl	Liberia, R Liberia International	5100do			
0800	0900		Malaysia, Radio	7295do			
0800	0900	s	Malta, Voice of Mediterranean	11770eu			
0800	0900		Namibia, Namibian BC Corp	7165af	7215af		
0800	0900		New Zealand, R New Zealand Int	11720pa			
0800	0900		New Zealand, ZLXA	3935do	7290do		
0800	0900	vl	Nigeria, Radio/Enugu	6025do			
0800	0900	vl	Nigeria, Radio/Ibadan	6050do			
0800	0900	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0800	0900	vl	Nigeria, Radio/Lagos	3326do	4990do		
0800	0900	vl	Papua New Guinea, NBC	4890do	9675irr		
0800	0900		Russia, Voice of Russia WS	15490au	17495au	17525au	17635au
				17685au			
0800	0900	s	S Africa, Amateur Radio League	9750af	21560af		
0800	0900		Sierra Leone, Sierra Leone BS	3316do			
0800	0900		Singapore, SBC Radio One	6150do			
0800	0900	vl	Solomon Islands, SIBC	5020do			
0800	0900		South Korea, R Korea Intl	9570om	13670eu		
0800	0900		Sri Lanka, Sri Lanka BC Corp	6130do			
0800	0900		Uganda, Radio	5026do	7110do	7196do	
0800	0900		UK, BBC World Service	6190af	9740as	11940af	11955pa
				12095eu	15310as	15360as	15400af
				15485eu	15565eu	17640eu	17760as
0800	0900	as	UK, BBC World Service	15575as			
0800	0900		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
0800	0900		USA, KAIJ Dallas TX	5755va			
0800	0900		USA, KNLS Anchor Point AK	11765as			
0800	0900		USA, KTBN Salt Lake City UT	7510na			
0800	0900		USA, KWHR Naalehu HI	11565pa	17780as		
0800	0900		USA, Voice of America	11930as	13610as	15150as	
0800	0900		USA, WEWN Birmingham AL	5825na			
0800	0900		USA, WHRA Greenbush ME	11730af			
0800	0900		USA, WHRI Noblesville IN	5745va	7315am		
0800	0900		USA, WJCR Upton KY	7490am	13595as		
0800	0900		USA, WRNO New Orleans LA	7395am			
0800	0900		USA, WSHB Cypress Crk SC	9845au	9860eu	11615eu	
0800	0900		USA, WTJC Newport NC	9370na			
0800	0900		USA, WWCR Nashville TN	3210na	5070na	5935na	7435na
0800	0900	vl	Vanuatu, Radio	3945do	4960do	7260do	
0800	0900		Zambia, Christian Voice	9865do			
0800	0900	vl	Zambia, National BC Corp	6165do	6265do		
0800	0900	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
0810	0830	s	Armenia, Voice of	4810eu	15270eu		
0815	0900		Guam, KTWR/ Trans World R	15200as	15330as		
0815	0900	f	Seychelles, FEBA Radio	15460as			
0830	0900	vl	Australia, ABC/Alice Springs	2310do			
0830	0900	vl	Australia, ABC/Katherine	2485do			
0830	0900	vl	Australia, ABC/Tennant Creek	2325do			
0830	0900		Austria, AWR Europe	17780af			
0830	0900		Georgia, Georgian Radio	11910me			
0830	0900		Italy/Adv World Radio Europe	9610eu			
0830	0900		Lithuania, Radio Vilnius	9710eu			
0830	0900		Switzerland, Swiss R International	21770af			
0855	0900	s	Taiwan, CBS	11725as			

0900 UTC - 5AM E / 4AM C / 2AM P

0900	0915	vl	Ghana, Ghana BC Corp	3366do	4915do		
0900	0929		Czech Rep, Radio Prague Intl	21745as			
0900	0930		Guam, KTWR/ Trans World R	15330as			
0900	0930		UK, BBC World Service	6190af	6195as	9605as	9740as
				11760me	11940af	11945as	12095eu
				15190sa	15310as	15360as	15400af
				15485eu	15565eu	15575as	17640eu
				17655as	17760as	17790as	17830af
				17885af	21470af	21660as	
0900	0945		Germany, Deutsche Welle	6140eu	6160pa	12035af	15410af
				15470as	17715pa	17770pa	17800af
				17820as	21560af	21680pa	21790as
0900	1000		Anguilla, Caribbean Beacon	6090am			
0900	1000	vl	Australia, ABC/Alice Springs	2310do			
0900	1000	vl	Australia, ABC/Katherine	2485do			
0900	1000	vl	Australia, ABC/Tennant Creek	2325do			
0900	1000		Australia, Christian Voice	13755as			
0900	1000		Australia, Radio	9580va	13605va	15240as	21820va
0900	1000	as	Australia, Radio	15400as	17750as		
0900	1000	vl	Botswana, Radio	7255do	9600do	7255do	
0900	1000		Canada, CFRX Toronto ON	6070do			
0900	1000		Canada, CFVP Calgary AB	6030do			
0900	1000		Canada, CHNX Halifax, NS	6130do			
0900	1000		Canada, CKZN St John's NF	6160do			
0900	1000		Canada, CKZU Vancouver BC	6160do			
0900	1000		China China Radio International	11730pa	15210pa		
0900	1000		Costa Rica, R for Peace Intl	15049irr	15049va		
0900	1000		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	17645as	
0900	1000		Ecuador, HCJB	11775pa	21455usb		
0900	1000	mtwhf	Eqt Guinea, Radio Africa	15185af			
0900	1000	as/vl	Eqt. Guinea, Radio East Africa	15185af			
0900	1000	a/monthly	Finland, Scandv Weekend Radio	11690va			
0900	1000	a	Germany, Good News World R	5985eu	5995eu		
0900	1000		Germany, Overcomer Ministries	13800pa	13810au		
0900	1000		Germany, Trans World Radio	12070eu			
0900	1000		Germany, Voice of Hope	5975eu	21590me		
0900	1000		Guyana, Voice of	3289do	5949do		
0900	1000	as/vl	Italy, Italian Radio Relay Service	7120va			
0900	1000		Kenya, Kenya BC Corp	4935do			
0900	1000	vl	Lesotho, Radio	4800do			
0900	1000	vl	Liberia, ELWA	4760do			
0900	1000	vl	Liberia, R Liberia International	6100do			
0900	1000		Malaysia, Radio	7295do			
0900	1000		Namibia, Namibian BC Corp	7165af	7215af		
0900	1000		New Zealand, R New Zealand Int	11720pa			
0900	1000		New Zealand, ZLXA	3935do	7290do		

0900	1000	vl	Nigeria, Radio/Enugu	6025do			
0900	1000	vl	Nigeria, Radio/Ibadan	6050do			
0900	1000	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
0900	1000	vl	Nigeria, Radio/Lagos	3326do	4990do		
0900	1000		Palau, KHBN/Voice of Hope	15725as			
0900	1000	vl	Papua New Guinea, NBC	4890do	9675irr		
0900	1000		Sierra Leone, Sierra Leone BS	3316do			
0900	1000		Singapore, SBC Radio One	6150do			
0900	1000	vl	Solomon Islands, SIBC	5020do			
0900	1000		Sri Lanka, Sri Lanka BC Corp	6130do			
0900	1000		Uganda, Radio	5026do	7110do	7196do	
0900	1000		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
0900	1000		USA, KAIJ Dallas TX	5755va			
0900	1000		USA, KTBN Salt Lake City UT	7510na			
0900	1000		USA, KWHR Naalehu HI	11565pa	17780as		
0900	1000		USA, Voice of America	11930as	13610as	15150as	
0900	1000		USA, WEWN Birmingham AL	5825na			
0900	1000		USA, WHRA Greenbush ME	11730af			
0900	1000		USA, WHRI Noblesville IN	5745va	7315am		
0900	1000		USA, WJCR Upton KY	7490am	13595as		
0900	1000	mtwhfa	USA, WRMI Miami FL	9955am			
0900	1000		USA, WSHB Cypress Crk SC	9455eu	9860eu	11615eu	
0900	1000		USA, WTJC Newport NC	9370na			
0900	1000		USA, WWCR Nashville TN	2390na	5070na	5935na	7435na
0900	1000	vl	Vanuatu, Radio	3945do	4960do	7260do	
0900	1000	mt hfa	Vatican City, Vatican Radio	5885eu			
0900	1000		Zambia, Christian Voice	9865do			
0900	1000	vl	Zambia, National BC Corp	6165do	6265do		
0900	1000	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
0910	0920		Greece, Voice of	12105eu	15630eu		
0915	1000	vl	Ghana, Ghana BC Corp	6130do	4915do		
0915	1000	vl/as	Ghana, Ghana BC Corp	4915do	4915do		
0930	1000		Netherlands, Radio	9790as	12065as	13710as	
0945	1000		Germany, Deutsche Welle	6140eu			

1000 UTC - 6AM E / 5AM C / 3AM P

1000	1027		Vietnam, Voice of	12019as	15115as		
1000	1030		Guam, KSDA/ Adventist World R	11560as	11705as		
1000	1030		Netherlands, Radio	9790as	12065as	13710as	
1000	1030		Palau, KHBN/Voice of Hope	15725as			
1000	1030		Singapore, RTE Radio	11685au			
1000	1030		Sri Lanka, Sri Lanka BC Corp	4940do			
1000	1100		Anguilla, Caribbean Beacon	11775am			
1000	1100	vl	Australia, ABC/Alice Springs	2310do			
1000	1100	vl	Australia, ABC/Katherine	2485do			
1000	1100	vl	Australia, ABC/Tennant Creek	2325do			
1000	1100		Australia, Christian Voice	13775as	17825as		
1000	1100		Australia, Radio	9580va	13605va	15240as	15400as
				17750as	21820va		
1000	1100	as	Bhutan, Bhutan BC Service	6035do			
1000	1100	vl	Botswana, Radio	7255do	9600do	7255do	
1000	1100		Canada, CFRX Toronto ON	6070do			
1000	1100		Canada, CFVP Calgary AB	6030do			
1000	1100		Canada, CHNX Halifax, NS	6130do			
1000	1100		Canada, CKZN St John's NF	6160do			
1000	1100		Canada, CKZU Vancouver BC	6160do			
1000	1100		China China Radio International	11730pa	15210pa		
1000	1100		Costa Rica, R for Peace Intl	15049irr	15049va		
1000	1100		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	17645as	
1000	1100		Ecuador, HCJB	11755pa	21455usb		
1000	1100	mtwhf	Eqt Guinea, Radio Africa	15185af			
1000	1100	as/vl	Eqt. Guinea, Radio East Africa	15185af			
1000	1100	a/monthly	Finland, Scandv Weekend Radio	11690va			
1000	1100		Germany, Deutsche Welle	6140eu			
1000	1100		Germany, Voice of Hope	21590me			
1000	1100	vl	Ghana, Ghana BC Corp	6130do	4915do		
1000	1100	vl/as	Ghana, Ghana BC Corp	4915do	4915do		
1000	1100		Guyana, Voice of	5949do			
1000	1100		India, All India Radio	11585as	13700au	15020as	17485au
				17840au	17895au		
1000	1100	as/vl	Italy, Italian Radio Relay Service	7120va			
1000	1100		Japan, Radio	9695pa	15590as	21755pa	
1000	1100		Jordan, Radio	11690eu			
1000	1100		Kenya, Kenya BC Corp	4935do			
1000	1100	vl	Lesotho, Radio	4800do			
1000	1100	vl	Liberia, ELWA	4760do			
1000	1100	vl	Liberia, R Liberia International	6100do			
1000	1100		Malaysia, Radio	7295do			
1000	1100		Namibia, Namibian BC Corp	7165af	7215af		
1000	1100		New Zealand, R New Zealand Int	11720pa			
1000	1100		New Zealand, ZLXA	3935do			
1000	1100	vl	Nigeria, Radio/Enugu	6025do			
1000	1100	vl	Nigeria, Radio/Ibadan	6050do			
1000	1100	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
1000	1100	vl	Nigeria, Radio/Lagos	4990do	7285do		
1000	1100	vl	Nigeria, Voice of	7255af	15120af		
1000	1100	vl	Papua New Guinea, NBC	4890do	9675irr		
1000	1100		Seirra Leone, Sierra Leone BS	5980do			
1000	1100		Singapore, SBC Radio One	6150do			
1000	1100	vl	Solomon Islands, SIBC	5020do			
1000	1100		Uganda, Radio	5026do	7110do	7196do	
1000	1100		UK, BBC World Service	6190af	6195va	9740as	11760me
				11940af	12095eu	15310as	15360as
				15485eu	15565eu	15575as	17640eu
				17760as	17790as	17885af	21470af
				21660as			
1000	1100	as	UK, BBC World Service	15190sa	15400af	17830af	
1000	1100		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
1000	1100		USA, KAIJ Dallas TX	5755va			
1000	1100		USA, KTBN Salt Lake City UT	7510na			
1000	1100		USA, KWHR Naalehu HI	9930as	11565pa		
1000	1100		USA, Voice of America	6165am	7370am	9590am	9770pa
				15240as	15425as		
1000	1100		USA, WEWN Birmingham AL	7425na	15745eu		
1000	1100		USA, WHRI Noblesville IN	6040na	9495am		
1000	1100		USA, WJCR Upton KY	7490am	13595as		
1000	1100	mtwhfa	USA, WRMI Miami FL	9955am			
1000	1100		USA, WRNO New Orleans LA	7395am			
1000	1100		USA, WSHB Cypress Crk SC	6095am	9455sa	11870as	
1000	1100		USA, WTJC Newport NC	9370na			
1000	1100		USA, WWCR Nashville TN	5070na	5935na	7435na	9475na
1000	1100		USA, WYFR Okeechobee FL	5950na			
1000	1100	vl	Vanuatu, Radio	3945do	4960do	7260do	
1000	1100		Zambia, Christian Voice	9865do			
1000	1100	vl	Zambia, National BC Corp	6165do	6265do		
1000	1100	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
10000	1030		Switzerland, Swiss R International	15315eu			
1030	1035		Israel, Kol Israel	15640va	17545va		
1030	1045	mtwhf	Ethiopia, Radio	5990do	7110do	9705do	
1030	1100		Guam, KSDA/ Adventist World R	11560as			
1030	1100		Malaysia, RTM Sarawak	7160do			
1030	1100		Mongolia, Voice of	12085au			
1030	1100		Netherlands, Radio	6045eu	9760as	9860eu	12065as
				13710as			
1030	1100		Palau, KHBN/Voice of Hope	9965as	15725as		
1030	1100		Sri Lanka, Sri Lanka BC Corp	4940do	11835as	15120as	17850as
1030	1100		UAE, Radio Dubai	13675eu	15370eu	15395eu	21605eu

1100 UTC - 7AM E / 6AM C / 4AM P

1100	1105		New Zealand, R New Zealand Int	11720pa			
1100	1105		Pakistan, Radio	17520eu	21465eu		
1100	1120	fa	Kazakhstan, Radio Almaty	9620eu	11840eu		
1100	1127		Vietnam, Voice of	7285as			
1100	1130		Netherlands, Radio	6045eu	9790as	9860eu	12065as
				13710as			
1100	1130		Sri Lanka, Sri Lanka BC Corp	4940do	11835as	15210as	17850as
1100	1130	mtwhf	UK, BBC Caribbean Report	6195ca	15220ca		
1100	1130	as	UK, BBC World Service	6195am	15190sa	15220am	
1100	1130		Ukraine, R Ukraine International	12045eu	15135na		
1100	1145		Germany, Deutsche Welle	6140eu	11785af	15410af	17860af
				21780af			
1100	1200		Anguilla, Caribbean Beacon	11775am			
1100	1200	vl	Australia, ABC/Alice Springs	2310do			
1100	1200	vl	Australia, ABC/Katherine	2485do			
1100	1200	vl	Australia, ABC/Tennant Creek	2325do			
1100	1200		Australia, Christian Voice	13775as	17825as		
1100	1200		Australia, Radio	5995pa	6020va	9475as	9580va
				11880as	12080pa	13605va	21820va
1100	1200	vl	Botswana, Radio	7255do	9600do	7255do	
1100	1200		Bulgaria, Radio	15700eu	17500eu		
1100	1200		Canada, CBC Northern Service	9625do			
1100	1200		Canada, CFRX Toronto ON	6070do			
1100	1200		Canada, CFVP Calgary AB	6030do			
1100	1200		Canada, CHNX Halifax, NS	6130do			
1100	1200		Canada, CKZN St John's NF	6160do			
1100	1200		Canada, CKZU Vancouver BC	6160do			
1100	1200		Costa Rica, R for Peace Intl	15049irr	15049va		
1100	1200		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	17645as	
1100	1200		Ecuador, HCJB	12005am	15115am	21455usb	
1100	1200	mtwhf	Eqt Guinea, Radio Africa	15185af			
1100	1200	as/vl	Eqt. Guinea, Radio East Africa	15185af			
1100	1200	a/monthly	Finland, Scandv Weekend Radio	11690va			
1100	1200		Germany, Voice of Hope	21590me			
1100	1200	vl	Ghana, Ghana BC Corp	6130do	4915do		
1100	1200	vl/as	Ghana, Ghana BC Corp	4915do	4915do		
1100	1200		Guyana, Voice of	5949do			
1100	1200		Iran, VOIRI	15385as	15430as	15585as	21470as
				21730as			
1100	1200	as/vl	Italy, Italian Radio Relay Service	7120va			
1100	1200		Japan, Radio	6120na	9695pa	15590as	
1100	1200		Jordan, Radio	11690eu			
1100	1200		Kenya, Kenya BC Corp	4935do			
1100	1200	vl	Lesotho, Radio	4800do			
1100	1200	vl	Liberia, ELWA	4760do			
1100	1200	vl	Liberia, R Liberia International	6100do			
1100	1200		Malaysia, Radio	7295do			
1100	1200		Malaysia, TRM Sarawak	7160do			
1100	1200		Namibia, Namibian BC Corp	7165af	7215af		
1100	1200		New Zealand, ZLXA	3935do			
1100	1200	vl	Nigeria, Radio/Enugu	6025do			
1100	1200	vl	Nigeria, Radio/Ibadan	6050do			
1100	1200	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do

1100	1200	vl	Nigeria, Radio/Lagos	4990do	7285do		
1100	1200		Palau, KHBN/Voice of Hope	9965as			
1100	1200	vl	Papua New Guinea, NBC	4890do	9675irr		
1100	1200		Sierra Leone, Sierra Leone BS	5980do			
1100	1200		Singapore, R Singapore Intl	6150as	9600as		
1100	1200		Switzerland, Swiss R International	13735as	21770as		
1100	1200		Taiwan, Voice of Asia	7445as			
1100	1200		Uganda, Radio	5026do	7110do	7196do	
1100	1200		UK, BBC World Service	5965na	6190af	9740as	9815as
				11760me	11940af	11955as	12095eu
				15280as	15310as	15400af	15485eu
				15565eu	15575as	17640eu	17700as
				17790sa	17830af	17885af	21470af
1100	1200		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
1100	1200		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
1100	1200		USA, KAIJ Dallas TX	5755va			
1100	1200		USA, KTBN Salt Lake City UT	7510na			
1100	1200		USA, KWHR Naalehu HI	9930as	11565pa		
1100	1200		USA, Voice of America	6160as	9645as	9760as	9770pa
				15160as	15240as	15425as	
1100	1200		USA, WEWN Birmingham AL	7425na	15745eu		
1100	1200		USA, WHRI Noblesville IN	6040na	9495am		
1100	1200	a s	USA, WINB Red Lion PA	13750am			
1100	1200		USA, WJCR Upton KY	7490am	13595as		
1100	1200	mtwhfa	USA, WRMI Miami FL	9955am			
1100	1200		USA, WRNO New Orleans LA	7395am			
1100	1200		USA, WSHB Cypress Crk SC	6095am	9455am	11590am	11660am
1100	1200		USA, WTJC Newport NC	9370na			
1100	1200		USA, WWCR Nashville TN	5070na	5935na	7435na	15685na
1100	1200		USA, WYFR Okeechobee FL	5850na	5950na		
1100	1200	vl/s	Vanuatu, Radio	3945do	4960do	7260do	
1100	1200		Zambia, Christian Voice	9865do			
1100	1200	vl	Zambia, National BC Corp	6165do	6265do		
1100	1200	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do0		
1106	1200		New Zealand, R New Zealand Int	15175as			
1115	1145		Nepal, Radio	5005as	7165as		
1120	1140	w	Kazakhstan, Radio Almaty	9620eu	11840eu		
1130	1145	vl	Libya, Voice of Africa	11815af	15435af	17725af	
1130	1200	a	Austria, R Austria International	6155eu	13730eu		
1130	1200		Belgium, RVI Flanders R Intl	9865as	9925eu		
1130	1200		Belgium, RVI Flanders R Intl	9865as			
1130	1200		Netherlands, Radio	6045eu	9860eu		
1130	1200		South Korea, R Korea Intl	9650na			
1130	1200		Sri Lanka, Sri Lanka BC Corp	4940do			
1130	1200		Sweden, Radio	17505as	18960na		
1130	1200		Ukraine, R Ukraine International	15135na			
1130	1200	f	Vatican City, Vatican Radio	15595va	17515va		
1140	1200	t	Kazakhstan, Radio Almaty	9620eu	11840eu		
1145	1200		Germany, Deutsche Welle	6140eu			

1200 UTC - 8AM E / 7AM C / 5AM P

1200	1215		Somalia, Radio Galkayo	6985va			
1200	1220	mtwhf	UK, BBC Caribbean Report	6195ca	15220ca		
1200	1220	as	UK, BBC World Service	6195am	15220am		
1200	1225		Netherlands, Radio	6045eu	9860eu		
1200	1230		Iran, VOIRI	15385as	15430as	15585as	21470as
				21730as			
1200	1230		Philippines, FEBC	15110as			
1200	1230		Sri Lanka, Sri Lanka BC Corp	4940do			
1200	1230		Switzerland, Swiss R International	15315eu			
1200	1230		Uzbekistan, Radio Tashkent	7285as	9715as	15295as	17775as
1200	1245		USA, WYFR Okeechobee FL	5850na	5950na	17750na	
1200	1255		Poland, Radio Polonia	6095eu	7270eu	9525eu	11820eu
1200	1256		North Korea, Voice of Korea	3560va	9640va	9850va	9975va
				11334va	13650va		
1200	1300		Anguilla, Caribbean Beacon	11775am			
1200	1300	vl	Australia, ABC/Alice Springs	2310do			
1200	1300	vl	Australia, ABC/Katherine	2485do			
1200	1300	vl	Australia, ABC/Tennant Creek	2325do			
1200	1300		Australia, Christian Voice	13775as	13795as		
1200	1300		Australia, Radio	5995pa	6020va	9580va	11650pa
				11880as	21820va		
1200	1300	vl	Botswana, Radio	7255do	9600do	7255do	
1200	1300		Brazil, Radio Nacional Bras	15445am			
1200	1300		Canada, CBC Northern Service	9625do			
1200	1300		Canada, CFRX Toronto ON	6070do			
1200	1300		Canada, CFVP Calgary AB	6030do			
1200	1300		Canada, CHNX Halifax, NS	6130do			
1200	1300		Canada, CKZN St John's NF	6160do			
1200	1300		Canada, CKZU Vancouver BC	6160do			
1200	1300		Canada, R Canada International	9660as	15190as		
1200	1300	mtwhf	Canada, R Canada International	9640am	15305am	17820am	
1200	1300		China China Radio International	9730as	9760pa	11675pa	11980as
				15415pa			
1200	1300		Costa Rica, R for Peace Intl	15049irr	21815usb		
1200	1300		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	17645as	
1200	1300		Ecuador, HCJB	12005am	15115am	21455usb	
1200	1300	as/vl	Eqt. Guinea, Radio East Africa	15185af			
1200	1300	a/monthly	Finland, Scandv Weekend Radio	11720va			
1200	1300		France R France International	11610af	17620me	15195	
1200	1300		Germany, Deutsche Welle	6140eu			
1200	1300		Germany, Voice of Hope	15715me			
1200	1300	vl	Ghana, Ghana BC Corp	4915do	6130do		
1200	1300		Guyana, Voice of	5949do			
1200	1300	as/vl	Italy, Italian Radio Relay Service	7120va			
1200	1300		Jordan, Radio	11690eu			
1200	1300		Kenya, Kenya BC Corp	4935do			
1200	1300	vl	Lesotho, Radio	4800do			
1200	1300	vl	Liberia, ELWA	4760do			
1200	1300	vl	Liberia, R Liberia International	6100do			
1200	1300		Malaysia, Radio	7295do			
1200	1300		Namibia, Namibian BC Corp	7165af	7215af		
1200	1300		New Zealand, R New Zealand Int	15175as			
1200	1300		New Zealand, ZLXA	3935do			
1200	1300	vl	Nigeria, Radio/Enugu	6025do			
1200	1300	vl	Nigeria, Radio/Ibadan	6050do			
1200	1300	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
1200	1300	vl	Nigeria, Radio/Lagos	4990do	7285do		
1200	1300		Palau, KHBN/Voice of Hope	9965as			
1200	1300	vl	Papua New Guinea, NBC	4890do	9675irr		
1200	1300		Sierra Leone, Sierra Leone BS	5980do			
1200	1300		Singapore, R Singapore Intl	6150as	9600as		
1200	1300		Taiwan, Radio Taipei International	7130as	9610au		
1200	1300		Uganda, Radio	5026do	7110do	7196do	
1200	1300		UK, BBC World Service	5965na	6190af	9515as	9740as
				9815as	11760me	11940af	11955as
				12095eu	15280as	15310as	15485eu
				15565eu	15575as	17640eu	17700as
				17830af	17885af	21470af	
1200	1300		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va
				10940va	12579va	12689va	13254va
				13362va	16847va		
1200	1300		USA, KAIJ Dallas TX	13815va			
1200	1300		USA, KTBN Salt Lake City UT	7510na			
1200	1300		USA, KWHR Naalehu HI	9930as	11565pa		
1200	1300		USA, Voice of America	6160as	9645as	9760as	15160as
				15240as	15425as		
1200	1300		USA, WEWN Birmingham AL	7425na	15745eu		
1200	1300		USA, WHRI Noblesville IN	6040na	9495am		
1200	1300		USA, WINB Red Lion PA	13570am			
1200	1300		USA, WJCR Upton KY	7490am	13595as		
1200	1300	mtwhfa	USA, WRMI Miami FL	15724na			
1200	1300	s	USA, WRMI Miami FL	9955am			
1200	1300		USA, WRNO New Orleans LA	7395am			
1200	1300		USA, WSHB Cypress Crk SC	6095am	9455am	9875as	11590am
				11660am	17635as		
1200	1300		USA, WTJC Newport NC	9370na			
1200	1300		USA, WWCR Nashville TN	7435na	12160na	13845na	15685na
1200	1300	mtwhf	USA, WWFV McCaysville GA	9400va	12172va		
1200	1300	vl/s	Vanuatu, Radio	3945do	4960do	7260do	
1200	1300		Zambia, Christian Voice	9865do			
1200	1300	vl	Zambia, National BC Corp	6165do	6265do		
1200	1300	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do		
1205	1210		Croatia, Croatian Radio	6165eu	9830eu	13830eu	
1215	1300		Egypt, Radio Cairo	17595as			
1230	1257		Vietnam, Voice of	12019as	15115as		
1230	1300		Bangladesh, Bangla Betar	7185as	9550as	15520as	
1230	1300		Finland, YLE/Radio Finland	15400na	17670na		
1230	1300		Germany, Overcomer Ministries	6110eu			
1230	1300		Italy/Adv World Radio Europe	9610eu			
1230	1300		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as
				15425as			
1230	1300		Sweden, Radio	17505as	18960na	21530as	
1230	1300		Thailand, Radio	9655as	9885as	11905as	
1230	1300		Turkey, Voice of	17810as	17830eu		
1230	1300	a	UK, Wales Radio Intl/Merlin	17810au			
1245	1300	a	Seychelles, FEBA Radio	15535me			
1245	1300		USA, WYFR Okeechobee FL	17750na			
1255	1300	mtwhfa	Taiwan, CBS	6180as	7250as	9630as	11725as
				11775as			

1300 UTC - 9AM E / 8AM C / 6AM P

1300	1305		New Zealand, R New Zealand Int	15175as			
1300	1320		Brazil, Radio Nacional Bras	15445am			
1300	1329		Czech Rep, Radio Prague Intl	13580eu	21745as		
1300	1330		Egypt, Radio Cairo	17595as			
1300	1330	s	Germany, Universal Life	9955na			
1300	1330		Guam, KSDA/ Adventist World R	15385as			
1300	1330		Turkey, Voice of	17810as	17830eu		
1300	1400		Anguilla, Caribbean Beacon	11775am			
1300	1400	vl	Australia, ABC/Alice Springs	2310do			
1300	1400	vl	Australia, ABC/Katherine	2485do			
1300	1400	vl	Australia, ABC/Tennant Creek	2325do			
1300	1400		Australia, Christian Voice	13775as	13795as		
1300	1400		Australia, Radio	5995pa	6020va	9580va	11650pa
				11660as	21820va		
1300	1400	vl	Botswana, Radio	7255do	9600do	7255do	
1300	1400		Canada, CBC Northern Service	9625do			
1300	1400		Canada, CFRX Toronto ON	6070do			
1300	1400		Canada, CFVP Calgary AB	6030do			
1300	1400		Canada, CHNX Halifax, NS	6130do			
1300	1400		Canada, CKZN St John's NF	6160do			

1300	1400		Canada, CKZU Vancouver BC	6160do				
1300	1400		Canada, R Canada International	9640am	15305na			
1300	1400	mtwhf	Canada, R Canada International	17820am				
1300	1400	as	Canada, R Canada International	17800am				
1300	1400		China China Radio International	7405na	9570na	11675pa	11900pa	
				11980as	15180as			
1300	1400		China, Voice of Hope	13820as				
1300	1400		Costa Rica, R for Peace Intl	15049irr	21815usb			
1300	1400		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
				11870am	13749na	17645as		
1300	1400		Ecuador, HCJB	12005am	15115am	21455usb		
1300	1400	as/vl	Eqt. Guinea, Radio East Africa	15185af				
1300	1400	a/monthly	Finland, Scandv Weekend Radio	11720va				
1300	1400		Germany, Deutsche Welle	6140eu				
1300	1400		Germany, Overcomer Ministries	6110eu	13810af			
1300	1400		Germnay, Voice of Hope	15715me				
1300	1400	vl	Ghana, Ghana BC Corp	4915do	6130do			
1300	1400		Guyana, Voice of	5949do				
1300	1400	as/vl	Italy, Italian Radio Relay Service	7120va				
1300	1400		Jordan, Radio	11690eu				
1300	1400		Kenya, Kenya BC Corp	4935do				
1300	1400	vl	Lesotho, Radio	4800do				
1300	1400	vl	Liberia, ELWA	4760do				
1300	1400	vl	Liberia, R Liberia International	6100do				
1300	1400		Malaysia, Radio	7295do				
1300	1400		Namibia, Namibian BC Corp	7165af	7215af			
1300	1400		New Zealand, ZLXA	3935do				
1300	1400	vl	Nigeria, Radio/Enugu	6025do				
1300	1400	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1300	1400	vl	Nigeria, Radio/Lagos	4990do	7285do			
1300	1400		Palau, KHBN/Voice of Hope	9965as				
1300	1400	vl	Papua New Guinea, NBC	4890do	9675irr			
1300	1400	as	S Africa, Channel Africa	11720af	17780af	21725af		
1300	1400		Sierra Leone, Sierra Leone BS	5980do				
1300	1400		Singapore, R Singapore Intl	6150as	9600as			
1300	1400		South Korea, R Korea Intl	9570as	13670	om		
1300	1400		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as	
				15425as				
1300	1400		Uganda, Radio	4976do	5026do			
1300	1400		UK, BBC World Service	5965na	6190af	9515na	9740as	
				9815as	11760me	11865na	11940af	
				12095eu	15310as	15420af	15485eu	
				15565eu	15575eu	17640eu	17700as	
				17830af	17885af	21470af		
1300	1400		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
				6350va	6458va	6847va	10320va	
				10940va	12579va	12689va	13254va	
				13362va	16847va			
1300	1400		USA, KAIJ Dallas TX	13815va				
1300	1400		USA, KJES Vado NM	11715na				
1300	1400		USA, KNLS Anchor Point AK	11870as				
1300	1400		USA, KTBN Salt Lake City UT	7510na				
1300	1400		USA, KWHR Naalehu HI	9930as	11565pa			
1300	1400		USA, Voice of America	6160as	9645as	9760as	15160as	
				15425as				
1300	1400	a	USA, WBCQ Monticello ME	17495na				
1300	1400		USA, WEWN Birmingham AL	11875na				
1300	1400		USA, WHRI Noblesville IN	6040na	15105am			
1300	1400		USA, WINB Red Lion PA	13570am				
1300	1400		USA, WJCR Upton KY	7490am	13595as			
1300	1400	mtwhfa	USA, WRMI Miami FL	15724na				
1300	1400	s	USA, WRMI Miami FL	9955am				
1300	1400		USA, WRNO New Orleans LA	7395am				
1300	1400		USA, WSHB Cypress Crk SC	9430na	9455am	9940as		
1300	1400		USA, WTJC Newport NC	9370na				
1300	1400		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
1300	1400		USA, WWFV McCaysville GA	12172va				
1300	1400	mtwhf	USA, WWFV McCaysville GA	9400va				
1300	1400		USA, WYFR Okeechobee FL	11550as	11830na	11970na	17750na	
1300	1400		Zambia, Christian Voice	9865do				
1300	1400	vl	Zambia, National BC Corp	6165do	6265do			
1300	1400	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			
1305	1400	occsnal	New Zealand, R New Zealand Int	6095pa				
1325	1400		Germany, Voice of Hope	17550as				
1330	1357		Vietnam, Voice of	9730eu	11630eu	13740eu		
1330	1400	s	Austria, R Austria International	6155eu	13730eu	21789as		
1330	1400		Guam, KSDA/ Adventist World R	11705as	11980as			
1330	1400		India, All India Radio	9690as	11620as	13710as		
1330	1400		Sweden, Radio	17505va	18960na			
1330	1400		UAE, Radio Dubai	13630eu	13675eu	15395eu	21605eu	
1330	1400		Uzbekistan, Radio Tashkent	7285as	9715as	15295as	17775as	

1400 UTC - 10AM E / 9AM C / 7AM P

1400	1430		Ecuador, HCJB	12005am	15115am	21455usb		
1400	1430		Guam, KSDA/ Adventist World R	17720as				
1400	1430		Thailand, Radio	9655as	9830as	11905as		
1400	1430	as	UK, BBC World Service	15425as				
1400	1430	s	USA, Voice of America	18275va				
1400	1456		Romania, R Romania International	15250eu	17735eu			
1400	1500		Anguilla, Caribbean Beacon	11775am				
1400	1500	vl	Australia, ABC/Alice Springs	2310do				
1400	1500	vl	Australia, ABC/Katherine	2485do				
1400	1500	vl	Australia, ABC/Tennant Creek	2325do				
1400	1500		Australia, Christian Voice	13730as	13795as			
1400	1500		Australia, Radio	5995va	6080pa	9580va	11650pa	
				11660va				
1400	1500	vl	Botswana, Radio	7255do	9600do	7255do		
1400	1500	vl	Cameroon, CRTV Radio Buea	6005do				
1400	1500		Canada, CBC Northern Service	9625do				
1400	1500		Canada, CFRX Toronto ON	6070do				
1400	1500		Canada, CFVP Calgary AB	6030do				
1400	1500		Canada, CHNX Halifax, NS	6130do				
1400	1500		Canada, CKZN St John's NF	6160do				
1400	1500		Canada, CKZU Vancouver BC	6160do				
1400	1500		Canada, R Canada International	9640am	15305na			
1400	1500	mtwhf	Canada, R Canada International	17820am				
1400	1500	as	Canada, R Canada International	17800am				
1400	1500		China China Radio International	7180as	7405na	9700as	11675as	
				11765as	13685af	15125af		
1400	1500		China, Voice of Hope	13820as				
1400	1500		Costa Rica, R for Peace Intl	15049irr	21815usb			
1400	1500		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
				11870am	13749na	17645as		
1400	1500	as/vl	Eqt. Guinea, Radio East Africa	15185af				
1400	1500	a/monthly	Finland, Scandv Weekend Radio	11720va				
1400	1500		France R France International	11610as	17620me			
1400	1500		Germany, Deutsche Welle	6140eu				
1400	1500	as	Germany, Overcomer Ministries	17490eu				
1400	1500		Germany, Overcomer Ministries	6110eu	13810af			
1400	1500		Germany, Voice of Hope	15715me	17550as			
1400	1500	vl	Ghana, Ghana BC Corp	4915do	6130do			
1400	1500		Guyana, Voice of	5949do				
1400	1500		India, All India Radio	9690as	11620as	13710as		
1400	1500	as/vl	Italy, Italian Radio Relay Service	7120va				
1400	1500		Japan, Radio	7200pa	9505na	11730as	17755me	
1400	1500		Jordan, Radio	11690na	17680	al		
1400	1500		Kenya, Kenya BC Corp	4935do				
1400	1500	vl	Lesotho, Radio	4800do				
1400	1500	vl	Liberia, ELWA	4760do				
1400	1500	vl	Liberia, R Liberia International	6100do				
1400	1500		Malaysia, Radio	7295do				
1400	1500		Malaysia, RTM Sarawak	7160do				
1400	1500		Namibia, Namibian BC Corp	7165af	7215af			
1400	1500	occsnal	New Zealand, R New Zealand Int	6095pa				
1400	1500		New Zealand, ZLXA	3935do				
1400	1500	vl	Nigeria, Radio/Enugu	6025do				
1400	1500	vl	Nigeria, Radio/Ibadan	6050do				
1400	1500	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1400	1500	vl	Nigeria, Radio/Lagos	4990do	7285do			
1400	1500		Oman, Radio Sultanate of	15140va				
1400	1500		Palau, KHBN/Voice of Hope	9965as				
1400	1500		Russia, Voice of Russia WS	9495as	12055as	15510as		
1400	1500	as	S Africa, Channel Africa	11720af	17780af	21725af		
1400	1500		Sierra Leone, Sierra Leone BS	5980do				
1400	1500		Singapore, SBC Radio One	6150do				
1400	1500		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as	
				15425as				
1400	1500		Switzerland, Swiss R International	9575as	17680as			
1400	1500		Taiwan, Radio Taipei International	15125as				
1400	1500		Uganda, Radio	4976do	5026do			
1400	1500		UK, BBC World Service	6190af	6195as	9515na	9740as	
				9815as	11865na	11940af	12095eu	
				15220na	15310as	15485eu	15565eu	
				15575me	17640eu	17700as	17830af	
				17840am	21470af	21660af		
1400	1500		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
				6350va	6458va	6847va	10320va	
				10940va	12579va	12689va	13254va	
				13362va	16847va			
1400	1500		USA, KAIJ Dallas TX	13815va				
1400	1500		USA, KJES Vado NM	11715na				
1400	1500		USA, KTBN Salt Lake City UT	7510na				
1400	1500		USA, KWHR Naalehu HI	9930as	11565pa			
1400	1500		USA, Voice of America	6160as	7125as	9645as	9760as	
				15160as	15255va	15425as		
1400	1500		USA, WBCQ Monticello ME	17495na				
1400	1500		USA, WEWN Birmingham AL	11875na				
1400	1500		USA, WHRI Noblesville IN	6040na	15105am			
1400	1500		USA, WINB Red Lion PA	13750am				
1400	1500		USA, WJCR Upton KY	7490am	13595as			
1400	1500	mtwhfa	USA, WRMI Miami FL	15724na				
1400	1500	s	USA, WRMI Miami FL	9955am				
1400	1500		USA, WRNO New Orleans LA	7395am				
1400	1500		USA, WTJC Newport NC	9370na				
1400	1500		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
1400	1500		USA, WWFV McCaysville GA	12172va				
1400	1500	mtwhf	USA, WWFV McCaysville GA	12172va				
1400	1500		USA, WYFR Okeechobee FL	11550as	11830na	11970na	17750na	
1400	1500		Zambia, Christian Voice	9865do				
1400	1500	vl	Zambia, National BC Corp	6165do	6265do			
1400	1500	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			
1415	1420		Nepal, Radio	5005as	7165as			
1430	1500		Guam, KTWR/ Trans World R	15330as				
1430	1500		Malaysia, RTM Kota Kinabalu	5980do				
1430	1500		Myanmar, Radio	5985do				
1430	1500		Netherlands, Radio	9890as	11835as	12075as		

1500 UTC - 11AM E / 10AM C / 8AM P

1500	1530		Germany, Voice of Hope	17550as				
1500	1530		Mexico, R Mexico International	9705am	11770am			
1500	1530		Mongolia, Voice of	12015as	12085as			

1500	1530		S Africa, Channel Africa	17770af				
1500	1530	a	Seychelles, FEBA Radio	11600as				
1500	1530		USA, VOA Special English	6160as	9590as	9760as	9845as	12040as
1500	1556		North Korea, Voice of Korea	4405va	6574na	9335na	11710na	13760na
1500	1559		Canada, R Canada International	15455as	17720as			
1500	1559	as	Canada, R Canada International	9640am	15305am	17800am		
1500	1600		Anguilla, Caribbean Beacon	11775am				
1500	1600	vl	Australia, ABC/Alice Springs	2310do				
1500	1600	vl	Australia, ABC/Katherine	2485do				
1500	1600	vl	Australia, ABC/Tennant Creek	2325do				
1500	1600		Australia, Christian Voice	13730as	13795as			
1500	1600		Australia, Radio	5995va	6080pa	9580va	11650pa	11660va
1500	1600	vl	Botswana, Radio	7255do	9600do	7255do		
1500	1600		Canada, CBC Northern Service	9625do				
1500	1600		Canada, CFRX Toronto ON	6070do				
1500	1600		Canada, CFVP Calgary AB	6030do				
1500	1600		Canada, CHNX Halifax, NS	6130do				
1500	1600		Canada, CKZN St John's NF	6160do				
1500	1600		Canada, CKZU Vancouver BC	6160do				
1500	1600		China China Radio International	7160as	7405na	9785as	13685af	15125af
1500	1600		China, Voice of Hope	13820as				
1500	1600		Costa Rica, R for Peace Intl	15049irr	21815usb			
1500	1600		Costa Rica, University Network	5030am	6150am	7375am	9724sa	11870am
1500	1600	as/vl	Eqt. Guinea, Radio East Africa	15185af				
1500	1600	a/monthly	Finland, Scandv Weekend Radio	11720va				
1500	1600		Germany, Deutsche Welle	6140eu				
1500	1600	as	Germany, Overcomer Ministries	17490eu				
1500	1600		Germany, Overcomer Ministries	5110eu	13810af			
1500	1600		Germany, Voice of Hope	15715me				
1500	1600	vl	Ghana, Ghana BC Corp	4915do	6130do			
1500	1600		Guam, KTWR/ Trans World R	15330as				
1500	1600		Guyana, Voice of	5949do				
1500	1600		Japan, Radio	7200pa	9750as	11730as		
1500	1600		Jordan, Radio	11690na	17680al			
1500	1600		Kenya, Kenya BC Corp	4935do				
1500	1600	vl	Lesotho, Radio	4800do				
1500	1600	vl	Liberia, ELWA	4760do				
1500	1600	vl	Liberia, R Liberia International	6100do				
1500	1600		Malaysia, Radio	7295do				
1500	1600		Malaysia, RTM Kota Kinabalu	5980do				
1500	1600		Malaysia, RTM Sarawak	7160do				
1500	1600		Myanmar, Radio	5985do				
1500	1600		Namibia, Namibian BC Corp	7165af	7215af			
1500	1600		Netherlands, Radio	9890as	11835as	12075as		
1500	1600	occsnal	New Zealand, R New Zealand Int	6095pa				
1500	1600		New Zealand, ZLXA	3935do				
1500	1600	vl	Nigeria, Radio/Enugu	6025do				
1500	1600	vl	Nigeria, Radio/Ibadan	6050do				
1500	1600	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1500	1600	vl	Nigeria, Radio/Lagos	4990do	7285do			
1500	1600	vl	Nigeria, Voice of	7255af	15120af			
1500	1600		Russia, Voice of Russia WS	4940me	4965me	4975me	7325me	9730eu
1500	1600		Sierra Leone, Sierra Leone BS	5980do				
1500	1600		Singapore, SBC Radio One	6150do				
1500	1600		Sri Lanka, Sri Lanka BC Corp	4940do	6005as	6075as	9770as	15425as
1500	1600		Uganda, Radio	4976do	5026do			
1500	1600		UK, BBC World Service	5975as	6190af	6195as	9515na	9740as
				12095af	12095eu	15220na	15310as	15400af
				15420af	15485eu	15565eu	17700as	17830af
				17840am	21470af	21490af	21660af	
1500	1600	s	UK, Merlin Network One	6175eu				
1500	1600		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	6350va
				6458va	6847va	10320va	10940va	12579va
				12689va	13254va	13362va	16847va	
1500	1600		USA, KAIJ Dallas TX	13815va				
1500	1600		USA, KTBN Salt Lake City UT	15590na				
1500	1600		USA, KWHR Naalehu HI	9930as	11565pa			
1500	1600		USA, Voice of America	7125as	9645as	9700me	15205eu	15255va
1500	1600		USA, WBCQ Monticello ME	17495na				
1500	1600		USA, WEWN Birmingham AL	11875na				
1500	1600		USA, WHRA Greenbush ME	17650af				
1500	1600		USA, WHRI Noblesville IN	13760va	15105am			
1500	1600		USA, WINB Red Lion PA	13570am				
1500	1600		USA, WJCR Upton KY	7490am	13595as			
1500	1600	mtwhfa	USA, WRMI Miami FL	15724na				
1500	1600	s	USA, WRMI Miami FL	9955am				
1500	1600		USA, WRNO New Orleans LA	7395am	15420al			
1500	1600		USA, WTJC Newport NC	9370na				
1500	1600		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
1500	1600		USA, WWFV McCaysville GA	12172va				
1500	1600	mtwhf	USA, WWFV McCaysville GA	12172va				
1500	1600		USA, WYFR Okeechobee FL	5280as	11830na	17750na		
1500	1600		Zambia, Christian Voice	4965do				
1500	1600	vl	Zambia, National BC Corp	6165do	6265do			
1500	1600	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			
1530	1545		Afghanistan, Voice of Shari'ah	7002irr	7083as			
1530	1545		Bangladesh, Bangla Betar	4882as	15520as			
1530	1545		Seychelles, FEBA Radio	11600as				
1530	1600		Austria, AWR Europe	7165eu	17660as			
1530	1600		Austria, R Austria International	6155eu	13730eu	17865na		
1530	1600	vl	Botswana, Radio	3356do	4820do	7255do		
1530	1600		Georgia, Georgian Radio	6180me				
1530	1600		Iran, VOIRI	7245as	9635as	11775na		
1530	1600	mtwhf	S Africa, World Beacon	6145af				
1545	1600	s h	Bangladesh, Bangla Betar	4882as	15520as			
1545	1600	smtw a	Seychelles, FEBA Radio	11600as				
1550	1600		Vatican City, Vatican Radio	12065au	13765au	15235au		

1600 UTC - 12PM E / 11AM C / 9AM P

1600	1610		Vatican City, Vatican Radio	12065au	13765au	15235au		
1600	1615		Pakistan, Radio	11570me	15100af	15725af	17720af	
1600	1625		Netherlands, Radio	9890as	11835as	12075as		
1600	1627		Czech Rep, Radio Prague Intl	5930eu	21745af			
1600	1630		Iran, VOIRI	7245as	9635as	11775as		
1600	1630		Israel, Kol Israel	15615va	15640va	17545va	21665va	
1600	1630		Jordan, Radio	11690na	17680al			
1600	1630		Mexico, R Mexico International	9705am	11770am			
1600	1630		S Africa, Channel Africa	9525af				
1600	1630		UAE, Radio Dubai	13630eu	13675eu	15395eu	21605eu	
1600	1630	vl	Zimbabwe, Zimbabwe BC Corp	5975do	6045do			
1600	1645		Germany, Deutsche Welle	6140eu	6170as	7225as	9735af	11665af
1600	1650	occsnal	New Zealand, R New Zealand Int	6095pa				
1600	1656		North Korea, Voice of Korea	3560va	6520va	9660va	9975va	
1600	1700		Algeria, R Algiers International	11715va	15160va			
1600	1700		Anguilla, Caribbean Beacon	11775am				
1600	1700	vl	Australia, ABC/Alice Springs	2310do				
1600	1700	vl	Australia, ABC/Katherine	2485do				
1600	1700	vl	Australia, ABC/Tennant Creek	2325do				
1600	1700		Australia, Christian Voice	13730as	13795as			
1600	1700		Australia, Radio	5995va	6080pa	9580va	9655va	11650pa
1600	1700	vl	Botswana, Radio	3356do	4820do	7255do		11660va
1600	1700		Canada, CBC Northern Service	9625do				
1600	1700		Canada, CFRX Toronto ON	6070do				
1600	1700		Canada, CFVP Calgary AB	6030do				
1600	1700		Canada, CHNX Halifax, NS	6130do				
1600	1700		Canada, CKZN St John's NF	6160do				
1600	1700		Canada, CKZU Vancouver BC	6160do				
1600	1700		China China Radio International	7190af	13650af			
1600	1700		Costa Rica, R for Peace Intl	15049irr	21815usb			
1600	1700		Costa Rica, University Network	5030am	6150am	7375am	9724sa	11870am
1600	1700		Ethiopia, Radio	7165af	9560af			13749na
1600	1700	a/monthly	Finland, Scandv Weekend Radio	11690va				
1600	1700		France R France International	11615af	11995af	12015af	15605af	17605af
1600	1700	a	Germany, Good News World R	15105af				17850af
1600	1700	as	Germany, Overcomer Ministries	17490eu				
1600	1700	vl	Ghana, Ghana BC Corp	4915do	6130do			
1600	1700	a	Greece, Voice of	9420eu	15630eu	17705na		
1600	1700		Guam, KSDA/ Adventist World R	11850as				
1600	1700		Guyana, Voice of	5949do				
1600	1700		Kenya, Kenya BC Corp	4935do				
1600	1700	vl	Lesotho, Radio	4800do				
1600	1700	vl	Liberia, ELWA	4760do				
1600	1700	vl	Liberia, R Liberia International	6100do				
1600	1700		Malaysia, Radio	7295do				
1600	1700		Namibia, Namibian BC Corp	7165af	7215af			
1600	1700		New Zealand, ZLXA	3935do				
1600	1700	vl	Nigeria, Radio/Enugu	6025do				
1600	1700	vl	Nigeria, Radio/Ibadan	6050do				
1600	1700	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1600	1700	vl	Nigeria, Radio/Lagos	3326do	4990do			
1600	1700	vl	Nigeria, Voice of	7255af	15120af			
1600	1700		Russia, Voice of Russia WS	9875as	11985me	12065as	15540me	
1600	1700		S Africa, World Beacon	6145af				
1600	1700		Sierra Leone, Sierra Leone BS	5980do				
1600	1700		South Korea, R Korea Intl	5975om	6150eu	9515af	9870af	
1600	1700		Sri Lanka, Sri Lanka BC Corp	4940do				
1600	1700		Taiwan, Radio Taipei International	11550as				
1600	1700		Uganda, Radio	4976do	5026do			
1600	1700		UK, BBC World Service	3915as	5975as	6190af	6195as	
				7160as	9410eu	9410eu	9515na	9740as
				11940af	12095eu	15310as	15400af	15485eu
				15565eu	17700as	17830af	17840am	21470af
				21660af				
1600	1700	a	UK, Merlin Network One	6175eu				
1600	1700		UK, World Beacon	15455eu				
1600	1700		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	6350va
				6458va	6847va	10320va	10940va	12579va
				12689va	13254va	13362va	16847va	
1600	1700		USA, KAIJ Dallas TX	13815va				
1600	1700		USA, KTBN Salt Lake City UT	15590na				
1600	1700		USA, KWHR Naalehu HI	9930as				
1600	1700		USA, VOA Special English	13600af	15445af	17895af		
1600	1700		USA, Voice of America	6035af	6160as	7125as	9645as	9700me
				9760as	13605af	13710af	15205eu	15225af
				15255va	15410af			
1600	1700		USA, WBCQ Monticello ME	17495na				
1600	1700		USA, WEWN Birmingham AL	11875na	13615na	15745eu		
1600	1700		USA, WHRA Greenbush ME	17650af				
1600	1700		USA, WHRI Noblesville IN	13760va	15105am			
1600	1700		USA, WINB Red Lion PA	13570am				
1600	1700		USA, WJCR Upton KY	7490am	13595as			
1600	1700		USA, WMLK Bethel PA	15265eu				

1600	1700	mtwhfa	USA, WRMI Miami FL	15724na				
1600	1700	s	USA, WRMI Miami FL	9955am				
1600	1700		USA, WRNO New Orleans LA	7395am	15420al			
1600	1700		USA, WSHB Cypress Crk SC	18910af				
1600	1700		USA, WTJC Newport NC	9370na				
1600	1700		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
1600	1700		USA, WWFV McCaysville GA	12172va				
1600	1700	mtwhf	USA, WWFV McCaysville GA	12172va				
1600	1700		USA, WYFR Okeechobee FL	11830na	17750na	18980eu	21455eu	
			21525af					
1600	1700		Zambia, Christian Voice	4965do				
1600	1700	vl	Zambia, National BC Corp	6165do	6265do			
1615	1630		Vatican City, Vatican Radio	4005eu	5885eu	7250eu	9645eu	
			15595eu					
1615	1700	as	UK, BBC World Service	11860af	21490af			
1625	1640		Armenia, Trans World Radio	5855me				
1630	1657		Vietnam, Voice of	9730eu	11630al	13740eu		
1630	1700	vl	Cameroon, CRTV Radio Buea	6005do				
1630	1700		Egypt, Radio Cairo	15255af				
1630	1700	s	Seychelles, FEBA Radio	11605as				
1630	1700		Slovakia, R Slovakia International	5920eu	6055eu	7345eu		
1630	1700		Somalia, Radio Galkayo	6985va				
1630	1700	as	UK BBC World Service	9515na	11860af	21490af		
1630	1700	f	UK, Merlin Network One	11535as				
1630	1700	mtwh	UK, Merlin Network One	11590as				
1630	1700	as	UK, Merlin Network One	11540as				
1630	1700	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do			
1645	1700		Germany, Deutsche Welle	6140eu				
1651	1700	mtwhf	New Zealand, R New Zealand Int	6095as				

1700 UTC - 1PM E / 12PM C / 10AM P

1700	1727		Czech Rep, Radio Prague Intl	5930eu	21745af			
1700	1727		Vietnam, Voice of	12070eu				
1700	1730		Azerbaijan, Voice of	6110eu	9155eu			
1700	1730		France R France International	11615af	11995af	12015af	15605af	
			17605af	17850af				
1700	1730		Germany, Overcomer Ministries	6110eu				
1700	1730		S Africa, Channel Africa	17870af				
1700	1755		Poland, Radio Polonia	6000eu	7285eu			
1700	1756		Romania, R Romania International	11740eu	15365eu	15380eu	17805eu	
1700	1800		Anguilla, Caribbean Beacon	11775am				
1700	1800	vl	Australia, ABC/Alice Springs	2310do				
1700	1800	vl	Australia, ABC/Katherine	2485do				
1700	1800	vl	Australia, ABC/Tennant Creek	2325do				
1700	1800		Australia, Christian Voice	9720as	11890as			
1700	1800		Australia, Radio	5995va	6080pa	9580va	9655va	
			9815as	11880va				
1700	1800	vl	Botswana, Radio	3356do	4820do	7255do		
1700	1800		Canada, CBC Northern Service	9625do				
1700	1800		Canada, CFRX Toronto ON	6070do				
1700	1800		Canada, CFVP Calgary AB	6030do				
1700	1800		Canada, CHNX Halifax, NS	6130do				
1700	1800		Canada, CKZN St John's NF	6160do				
1700	1800		Canada, CKZU Vancouver BC	6160do				
1700	1800		China China Radio International	7150af	9570af	9670af	9695af	
			11910af					
1700	1800		Costa Rica, R for Peace Intl	15049irr	21815usb			
1700	1800		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
			11870am	13749na	17645as			
1700	1800		Egypt, Radio Cairo	15255af				
1700	1800	mtwhf	Eqt Guinea, Radio Africa	15185af				
1700	1800	a/monthly	Finland, Scandv Weekend Radio	11690va				
1700	1800		Germany, Deutsche Welle	6140eu				
1700	1800	a	Germany, Good News World R	11795me				
1700	1800	a	Germany, Overcomer Ministries	17490eu				
1700	1800		Germany, Voice of Hope	9495eu				
1700	1800		Germany. Unt Methodist Church	13820af	15485af			
1700	1800	vl	Ghana, Ghana BC Corp	3366do	4915do			
1700	1800		Guyana, Voice of	5949do				
1700	1800	vl	Italy, Italian Radio Relay Service	3985va				
1700	1800		Japan, Radio	9505na	11970eu	15355af		
1700	1800		Kenya, Kenya BC Corp	4935do				
1700	1800	vl	Lesotho, Radio	4800do				
1700	1800	vl	Liberia, ELWA	4760do				
1700	1800	vl	Liberia, R Liberia International	6100do				
1700	1800		Namibia, Namibian BC Corp	3270af	3289af			
1700	1800	mtwhf	New Zealand, R New Zealand Int	6095as				
1700	1800		New Zealand, ZLXA	3935do				
1700	1800	vl	Nigeria, Radio/Enugu	6025do				
1700	1800	vl	Nigeria, Radio/Ibadan	6050do				
1700	1800	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1700	1800	vl	Nigeria, Radio/Lagos	3326do	4990do			
1700	1800	as	Russia, Voice of Russia WS	7420eu	9480eu	9820eu		
1700	1800		Russia, Voice of Russia WS	9495af	9685eu	9775eu	9890eu	
			11510af	11985af				
1700	1800		S Africa, World Beacon	6145af				
1700	1800		Sierra Leone, Sierra Leone BS	5980do				
1700	1800		Sri Lanka, Sri Lanka BC Corp	4940irr				
1700	1800	vl	Sudan, Radio Omdurman	7199do	9200do	9505do		
1700	1800		Uganda, Radio	4976do	5026do			
1700	1800		UK, BBC World Service	3255af	3915as	5975as	6005af	
			6190af	6195eu	7160as	9410eu	9510as	
			9630af	9740as	12095eu	15400af	15420af	
			15485eu	15575me	17830af	17840na	21470af	
1700	1800	as	UK, Merlin Network One	11540as				
1700	1800		UK, World Beacon	15455eu				
1700	1800		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
			6350va	6458va	6847va	10320va	10940va	
			12579va	12689va	13254va	13362va	16847va	
1700	1800		USA, KAIJ Dallas TX	13815va				
1700	1800		USA, KTBN Salt Lake City UT	15590na				
1700	1800		USA, KWHR Naalehu HI	9930as				
1700	1800		USA, Voice of America	6160as	7125as	7170as	9645as	
			9700me	9760af	15255va	15410af	15445af	
			17895af					
1700	1800	mtwhf	USA, Voice of America	5990as	6045as	7215as	9550as	
			9770as	9785as				
1700	1800		USA, WBCQ Monticello ME	17495na				
1700	1800		USA, WEWN Birmingham AL	11875na	13615na	15745eu		
1700	1800		USA, WHRA Greenbush ME	17650af				
1700	1800		USA, WHRI Noblesville IN	9495am	13760va			
1700	1800		USA, WINB Red Lion PA	13570am				
1700	1800		USA, WJCR Upton KY	7490am	13595as			
1700	1800		USA, WMLK Bethel PA	15265eu				
1700	1800	mtwhf	USA, WRMI Miami FL	15724na				
1700	1800		USA, WRNO New Orleans LA	7395am	15420al			
1700	1800		USA, WSHB Cypress Crk SC	18910af				
1700	1800		USA, WTJC Newport NC	9370na				
1700	1800		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
1700	1800		USA, WWFV McCaysville GA	12172va				
1700	1800	mtwhf	USA, WWFV McCaysvillle GA	12172va				
1700	1800		USA, WYFR Okeechobee FL	13855af	18980eu	21455eu		
1700	1800		Zambia, Christian Voice	4965do				
1700	1800	vl	Zambia, National BC Corp	6165do	6265do			
1700	1800	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do			
1725	1740		Germany, Trans World Radio	5855eu				
1725	1745	mtwhf	UK, United Nations Radio	6125af	15265me	17580af		
1730	1745	vl	Libya, Voice of Africa	11815af	15435af	17725af		
1730	1745		Swaziland, Trans World Radio	9500af				
1730	1745	mtwhf	Swaziland, Trans World Radio	3200af				
1730	1800		Belgium, RVI Flanders R Intl	5910eu	9925eu	13770eu		
1730	1800		Georgia, Georgian Radio	6230eu				
1730	1800	as a	Georgia, Georgian Radio	6080as				
1730	1800		Guam, KSDA/ Adventist World R	11965as				
1730	1800		Netherlands, Radio	6020af	7120af	11655af		
1730	1800		Philippines, Radyo Pilipinas	11720pa	15190pa	17720pa		
1730	1800		S Africa, Adv World Radio Africa	12130af				
1730	1800	mtwhfa	Sweden, Radio	6065va				
1730	1800	s	Sweden, Radio	13580eu				
1730	1800		Switzerland, Swiss R International	15220af	17640af	21720af		
1730	1800		Vatican City, Vatican Radio	13765af	15570af	17515af		
1735	1745	vl/th	Paraguay, Radio Nacional	9739sa				
1745	1800		Bangladesh, Bangla Betar	7185eu	7462eu	9550eu	15520eu	
1745	1800		India, All India Radio	7410eu	9950as	11620eu	11935as	
			13750af	15200af	17670af			
1745	1800		Swaziland, Trans World Radio	3200af				
1745	1800	smtwhf	Swaziland, Trans World Radio	3200af				

1800 UTC - 2PM E / 1PM C / 11AM P

1800	1827		Vietnam, Voice of	7145eu	9730eu			
1800	1830		Egypt, Radio Cairo	15255af				
1800	1830	s	Germany, Universal Life	13855af				
1800	1830		Netherlands, Radio	6020af	7120af	11655af		
1800	1830		S Africa, Adv World Radio Africa	5960af	6100af			
1800	1830		S Africa, Channel Africa	17870af				
1800	1830	mtwh	UK, Merlin Network One	11590as				
1800	1830		UK, Merlin Network One	11540as				
1800	1830	f	UK, Merlin Network One	11535as				
1800	1830		UK, RTE Radio	15315me				
1800	1850	mtwhf	New Zealand, R New Zealand Int	6095as				
1800	1859		Canada, R Canada International	13690af	15200af	17820af	21570af	
1800	1900		Anguilla, Caribbean Beacon	11775am				
1800	1900	mtwhf	Argentina, RAE	15345eu				
1800	1900	vl	Australia, ABC/Alice Springs	2310do				
1800	1900	vl	Australia, ABC/Katherine	2485do				
1800	1900	vl	Australia, ABC/Tennant Creek	2325do				
1800	1900		Australia, Christian Voice	9720as	11890as			
1800	1900		Australia, Radio	6080as	7240pa	9580va	9655va	
			9815as	11880va				
1800	1900		Bangladesh, Bangla Betar	7185eu	7462eu	15520eu		
1800	1900	vl	Botswana, Radio	3356do	4820do			
1800	1900		Canada, CBC Northern Service	9625do				
1800	1900		Canada, CFRX Toronto ON	6070do				
1800	1900		Canada, CFVP Calgary AB	6030do				
1800	1900		Canada, CHNX Halifax, NS	6130do				
1800	1900		Canada, CKZN St John's NF	6160do				
1800	1900		Canada, CKZU Vancouver BC	6160do				
1800	1900		Costa Rica, R for Peace Intl	15049irr	21815usb			
1800	1900		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
			11870am	13749na	17645as			
1800	1900	mtwhf	Eqt Guinea, Radio Africa	15185af				
1800	1900	a/monthly	Finland, Scandv Weekend Radio	11690va				
1800	1900		Germany, Deutsche Welle	6140eu				
1800	1900		Germnay, Unt Methodist Church	13820af	15485af			
1800	1900		Germnay, Voice of Hope	9495eu				
1800	1900	vl	Ghana, Ghana BC Corp	3366do	4915do			
1800	1900	s	Greece, Voice of	9420eu	15630eu	17705na		
1800	1900		Guyana, Voice of	5949do				
1800	1900		India, All India Radio	7410as	9950as	11620as	11935as	
			13790af	15200af	17670af			
1800	1900	vl	Italy, Italian Radio Relay Service	3985va				
1800	1900		Kenya, Kenya BC Corp	4935do				
1800	1900		Kuwait, Radio	11990va				
1800	1900	vl	Lesotho, Radio	4800do				

1800	1900	vl	Liberia, ELWA	4760do				
1800	1900	vl	Liberia, R Liberia International	5100do				
1800	1900		Namibia, Namibian BC Corp	3270af	3289af			
1800	1900		New Zealand, ZLXA	3935do				
1800	1900	vl	Nigeria, Radio/Enugu	6025do				
1800	1900	vl	Nigeria, Radio/Ibadan	6050do				
1800	1900	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1800	1900	vl	Nigeria, Radio/Lagos	3326do	4990do			
1800	1900		Philippines, Radyo Pilipinas	11720pa	15190pa	17720pa		
1800	1900		Russia, Voice of Russia WS	7300eu	9480eu	9495af	9685eu	
				9775eu	9890eu	11630eu	11675eu	11695me
				11980af				
1800	1900	m	S Africa, Amateur Radio League	3215af				
1800	1900	as	S Africa, Radio Lufonia	3345af				
1800	1900		S Africa, World Beacon	3230af	9675af	17665af		
1800	1900		Sierra Leone, Sierra Leone BS	5980do				
1800	1900		Swaziland, Trans World Radio	3200af	9500af			
1800	1900		Taiwan, Radio Taipei International	3955eu				
1800	1900		Uganda, Radio	4976do	5026do			
1800	1900		UK, BBC World Service	3255af	5975as	6005af	6190eu	
				6195eu	9410eu	9510as	9740pa	12095eu
				15400af	15420af	15575me	17830af	17840na
				21470af				
1800	1900		UK, World Beacon	15585af	17665af			
1800	1900		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
				6350va	6458va	6847va	10320va	10940va
				12579va	12689va	13254va	13362va	16847va
1800	1900		USA, KAIJ Dallas TX	13815va				
1800	1900		USA, KJES Vado NM	15385au				
1800	1900		USA, KTBN Salt Lake City UT	15590na				
1800	1900		USA, KWHR Naalehu HI	17510as				
1800	1900		USA, Voice of America	6035af	7415af	9760af	9770me	
				11975af	15410af	15580af	17895af	
1800	1900	mtwhfa	USA, WBCQ Monticello ME	17495na				
1800	1900		USA, WEWN Birmingham AL	11875na	13615na	15745eu		
1800	1900		USA, WHRA Greenbush ME	17650af				
1800	1900		USA, WHRI Noblesville IN	9495am	13760va			
1800	1900		USA, WINB Red Lion PA	13570am				
1800	1900		USA, WJCR Upton KY	7490am	13595as			
1800	1900		USA, WMLK Bethel PA	15265eu				
1800	1900	mtwhf	USA, WRMI Miami FL	15724na				
1800	1900		USA, WRNO New Orleans LA	7395am	15420al			
1800	1900		USA, WSHB Cypress Crk SC	15665va	18910af			
1800	1900		USA, WTJC Newport NC	9370na				
1800	1900		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
1800	1900		USA, WWFV McCaysville GA	12172va				
1800	1900	mtwhf	USA, WWFV McCaysville GA	12172va				
1800	1900		USA, WYFR Okeechobee FL	18980eu				
1800	1900		Yemen, Rep of Yemen Radio	9780me				
1800	1900		Zambia, Christian Voice	4965do				
1800	1900	vl	Zambia, National BC Corp	6165do	6265do			
1800	1900	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do			
1800	1900		Sri Lanka, Sri Lanka BC Corp	4940irr				
1805	1810		Croatian, Croatian Radio	6165eu	13830eu			
1815	1845	s	S Africa, Radio Lufonia	7155af				
1830	1855		Greece, Voice of	11645eu				
1830	1900		Ascension Island, RTE Radio	21630af				
1830	1900		Austria, R Austria International	5945eu	6155eu			
1830	1900	vl	Cameroon, CRTV Radio Buea	6005do				
1830	1900		Canada, RTE Radio	13640na				
1830	1900		Georgia, Georgian Radio	11760eu				
1830	1900		Netherlands, Radio	6020af	7120af	9895af	11655af	
				13700af	17605af	21590af		
1830	1900		Slovakia, R Slovakia International	5920eu	6055eu	7345eu		
1830	1900		Turkey, Voice of	9730as	9785eu			
1830	1900	as	USA, Voice of America	11690af	13730af	15525af		
1845	1900		Albania, R Tirana International	7210eu	9510eu			
1845	1900		Congo, RTV Congolaise	5985do				
1851	1900		New Zealand, R New Zealand Int	15120pa				

1900 UTC - 3PM E / 2PM C / 12PM P

1900	1915		Congo, RTV Congolaise	5985do				
1900	1927		Vietnam, Voice of	9730eu	11630al	13740eu		
1900	1930		Hungary, Radio Budapest	7130eu				
1900	1930		Israel, Kol Israel	9435va	11605va	15615va	15640af	
				17545va				
1900	1930		Philippines, Radyo Pilipinas	11720pa	15190pa	17720pa		
1900	1930		Switzerland, Swiss R International	6110eu				
1900	1930		Turkey, Voice of	9730as	9785eu			
1900	1945		Germany, Deutsche Welle	11805af	11965af	13720af	15390af	
				17810af				
1900	1945		India, All India Radio	7410as	9950as	11620as	11935as	
				13790af	15200af	17670af		
1900	1956		North Korea, Voice of Korea	4405va	6574na	6595na	6615na	
				9335na	11710na	13760na		
1900	2000		Anguilla, Caribbean Beacon	11775am				
1900	2000	vl	Australia, ABC/Katherine	2485do				
1900	2000	vl	Australia, ABC/Tennant Creek	2325do				
1900	2000		Australia, Christian Voice	9720as				
1900	2000		Australia, Radio	6080as	7240pa	9500as	9580va	
				9815as	11880va			
1900	2000	vl	Botswana, Radio	3356do	4820do			
1900	2000		Bulgaria, Radio	9400eu	11900eu			
1900	2000		Canada, CFRX Toronto ON	6070do				
1900	2000		Canada, CFVP Calgary AB	6030do				
1900	2000		Canada, CHNX Halifax, NS	6130do				
1900	2000		Canada, CKZN St John's NF	6160do				
1900	2000		Canada, CKZU Vancouver BC	6160do				
1900	2000		Canada. CBC Northern Service	9625do				
1900	2000		China China Radio International	6165af	9440af	9585af		
1900	2000		Costa Rica, R for Peace Intl	15049irr	21815usb			
1900	2000		Costa Rica, University Network	5030am	6150am	7375am	9724sa	
				11870am	13749na	17645as		
1900	2000		Ecuador, HCJB	17660eu				
1900	2000	mtwhf	Eqt Guinea, Radio Africa	15185af				
1900	2000	a/monthly	Finland, Scandv Weekend Radio	11690va				
1900	2000		Germany, Voice of Hope	7290eu				
1900	2000	vl	Ghana, Ghana BC Corp	3366do	4915do			
1900	2000	vl	Italy, Italian Radio Relay Service	3985va				
1900	2000		Kenya, Kenya BC Corp	4935do				
1900	2000		Kuwait, Radio	11990va				
1900	2000	vl	Lesotho, Radio	4800do				
1900	2000	vl	Liberia, ELWA	4760do				
1900	2000	vl	Liberia, R Liberia International	5100do				
1900	2000	mtwhfa	Malta, Voice of Mediterranean	12060eu				
1900	2000		Namibia, Namibian BC Corp	3270af	3289af			
1900	2000		Netherlands, Radio	6020af	7120af	9895af	11655af	
				13700af	17605af	21590af		
1900	2000		New Zealand, R New Zealand Int	15120pa				
1900	2000		New Zealand, ZLXA	3935do				
1900	2000	vl	Nigeria, Radio/Enugu	6025do				
1900	2000	vl	Nigeria, Radio/Ibadan	6050do				
1900	2000	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do	
1900	2000	vl	Nigeria, Radio/Lagos	3326do	4990do			
1900	2000	vl	Nigeria, Voice of	7255af	15120af			
1900	2000		Russia, Voice of Russia WS	9480eu	9685eu	9775eu	9890eu	
				11675eu	12070eu			
1900	2000		Russia, World Beacon	7360eu				
1900	2000		S Africa, World Beacon	3230af	9675af	11640af		
1900	2000		Sierra Leone, Sierra Leone BS	3316do				
1900	2000	vl	Solomon Islands, SIBC	5020do				
1900	2000		South Korea, R Korea Intl	5975om	7275eu			
1900	2000		Sri Lanka, Sri Lanka BC Corp	4940irr				
1900	2000	a	Sri Lanka, Sri Lanka BC Corp	6010eu				
1900	2000		Swaziland, Trans World Radio	3200af				
1900	2000		Thailand, Radio	7160eu	9655eu	11905eu		
1900	2000		Uganda, Radio	4976do	5026do			
1900	2000		UK, BBC World Service	3255af	6005af	6190af	6195eu	
				9410eu	9630af	9740pa	12095eu	15400af
				15575me	17830af			
1900	2000	a	UK, BBC World Service	17840na				
1900	2000		UK, World Beacon	9675eu	15585eu			
1900	2000		USA, Armed Forces Radio	4278va	4319va	4993va	5765va	
				6350va	6458va	6847va	10320va	10940va
				12579va	12689va	13254va	13362va	16847va
1900	2000		USA, KAIJ Dallas TX	13815va				
1900	2000		USA, KTBN Salt Lake City UT	15590na				
1900	2000		USA, KWHR Naalehu HI	17510as				
1900	2000		USA, VOA Special English	7260eu	9680me	13690me		
1900	2000		USA, Voice of America	4950af	6035af	6160me	7375af	
				7415af	9525pa	9760af	9770af	11805pa
				11975af	15180pa	15410af	15445af	15580af
1900	2000	mtwhf	USA, Voice of America	9550eu	9840as	11780me	11780me	
				11970as	12015as	13725me	15235as	
1900	2000	mtwhfa	USA, WBCQ Monticello ME	17495na				
1900	2000		USA, WEWN Birmingham AL	11875na	13615na	15745eu		
1900	2000		USA, WHRA Greenbush ME	17650af				
1900	2000		USA, WHRI Noblesville IN	9495am	13760va			
1900	2000		USA, WINB Red Lion PA	13570am				
1900	2000		USA, WJCR Upton KY	7490am	13595as			
1900	2000		USA, WMLK Bethel PA	15265eu				
1900	2000	mtwhf	USA, WRMI Miami FL	15724na				
1900	2000		USA, WRNO New Orleans LA	7395am	15420al			
1900	2000		USA, WSHB Cypress Crk SC	15665va	18910af			
1900	2000		USA, WTJC Newport NC	9370na				
1900	2000		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na	
1900	2000		USA, WWFV McCaysville GA	12172va				
1900	2000	mtwhf	USA, WWFV McCaysville GA	12172va				
1900	2000		USA, WYFR Okeechobee FL	15775af	18980eu			
1900	2000		Zambia, Christian Voice	4965do				
1900	2000	vl	Zambia, National BC Corp	6165do	6265do			
1900	2000	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do			
1930	2000	t h	Belarus, R Belarus International	7105eu	7210eu			
1930	2000		Belgium, RVI Flanders R Intl	9925eu				
1930	2000		Iran, VOIRI	9022eu	11670eu	13730eu		
1930	2000	vl	Papua New Guinea, NBC	4890do				
1930	2000		Poland, Radio Polonia	6035eu	7185eu	7265eu	9525eu	
1930	2000		Sweden, Radio	6065eu				
1930	2000		Switzerland, Swiss R International	13770af	15220af	17580af	17735af	
1935	1955		Italy, RAI International	5970eu	9750eu			
1940	2000	mtwhfa	Armenia, Voice of	4810eu	9960eu			
1950	1950		Vatican City, Vatican Radio	4005eu	5885eu	7250eu	9645eu	

2000 UTC - 4PM E / 3PM C / 1PM P

2000	2010		Vatican City, Vatican Radio	4005eu	5885eu	7250eu	9645eu
				9660af	11625af	13765af	
2000	2015		Swaziland, Trans World Radio	3200af			
2000	2025		Netherlands, Radio	6020af	7120af	9895af	11655af
				13700af	17605af	21590af	
2000	2025		Poland, Radio Polonia	6035eu	7185eu	7265eu	9525eu
2000	2027		Czech Rep, Radio Prague Intl	5930eu	11600au		
2000	2030		Ecuador, HCJB	17660eu			
2000	2030		Iran, VOIRI	9022eu	11670eu	13730eu	
2000	2030		Mongolia, Voice of	12015eu	12085eu		
2000	2030		Switzerland, Swiss R International	13770af	15220af	17580af	13660af
				13790af			

2000	2030		USA, Voice of America	4950af	6035af	6095af	7375af
			7415af	9760as	9770af	11855af	11975af
			15410af	15445af	15580af	17745af	17895af
2000	2045		Germany, Deutsche Welle	7130eu			
2000	2045		Iraq, Radio Iraq International	7157irr	9684irr	11785irr	
2000	2050		New Zealand, R New Zealand Int	15120pa			
2000	2059		Canada, R Canada International	5995eu	11690eu	15325eu	17870eu
			21570eu				
2000	2100		Algeria, R Algiers International	11715eu	11750eu	15160va	
2000	2100		Anguilla, Caribbean Beacon	11775am			
2000	2100	vl	Australia, ABC/Alice Springs	2310do			
2000	2100	vl	Australia, ABC/Katherine	2485do			
2000	2100	vl	Australia, ABC/Tennant Creek	2325do			
2000	2100		Australia, Christian Voice	9720as			
2000	2100		Australia, Radio	9500as	9580va	9815as	11880va
			12080pa				
2000	2100	as	Australia, Radio	6080as	7240pa		
2000	2100	vl	Botswana, Radio	3356do	4820do		
2000	2100		Canada, CBC Northern Service	9625do			
2000	2100		Canada, CFRX Toronto ON	6070do			
2000	2100		Canada, CFVP Calgary AB	6030do			
2000	2100		Canada, CHNX Halifax, NS	6130do			
2000	2100		Canada, CKZN St John's NF	6160do			
2000	2100		Canada, CKZU Vancouver BC	6160do			
2000	2100		China China Radio International	5965eu	9440af	9840eu	11735af
			13640af				
2000	2100		Costa Rica, R for Peace Intl	15049irr	21815usb		
2000	2100		Costa Rica, University Network	5030am	6150am	7375am	9724sa
			11870am	13749na	17645as		
2000	2100	mtwhf	Eqt Guinea, Radio Africa	15185af			
2000	2100	a/monthly	Finland, Scandv Weekend Radio	11720va			
2000	2100		Germany, Voice of Hope	7290eu			
2000	2100	vl	Ghana, Ghana BC Corp	3366do	4915do		
2000	2100		Indonesia, Voice of	9525eu	11784eu	15149eu	
2000	2100	vl	Italy, Italian Radio Relay Service	3985va			
2000	2100		Kenya, Kenya BC Corp	4935do			
2000	2100		Kuwait, Radio	11990va			
2000	2100	vl	Lesotho, Radio	4800do			
2000	2100	vl	Liberia, ELWA	4760do			
2000	2100	vl	Liberia, R Liberia International	5100do			
2000	2100		Namibia, Namibian BC Corp	3270af	3289af		
2000	2100		New Zealand, ZLXA	3935do	7290do		
2000	2100	vl	Nigeria, Radio/Enugu	6025do			
2000	2100	vl	Nigeria, Radio/Ibadan	6050do			
2000	2100	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
2000	2100	vl	Nigeria, Radio/Lagos	3326do	4990do		
2000	2100	vl	Nigeria, Voice of	7255af	15120af		
2000	2100	vl	Papua New Guinea, NBC	4890do			
2000	2100		Russia, Voice of Russia WS	9480eu	9775eu	9890eu	11675eu
			12070eu	15455eu			
2000	2100		Russia, World Beacon	7360eu			
2000	2100		S Africa, World Beacon	3230af	9675af	11640af	15465eu
2000	2100		Sierra Leone, Sierra Leone BS	3316do			
2000	2100	vl	Solomon Islands, SIBC	5020do			
2000	2100	mtwhf	Spain, R Exterior Espana	9595af	15290eu		
2000	2100		Sri Lanka, Sri Lanka BC Corp	4940irr			
2000	2100	vl	Syria, Radio Damascus	12085eu	13610eu		
2000	2100		Uganda, Radio	4976do	5026do		
2000	2100		UK, BBC World Service	3255af	5975pa	6005af	6190af
			6195eu	9410eu	9630af	9740pa	11835af
			11945as	12095eu	15400af	17830af	
2000	2100		UK, World Beacon	7420af	9675af		
2000	2100		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
			6350va	6458va	6847va	10320va	10940va
			12579va	12689va	13254va	13362va	16847va
2000	2100		USA, KAIJ Dallas TX	13815va			
2000	2100		USA, KJES Vado NM	15385na			
2000	2100		USA, KTBN Salt Lake City UT	15590na			
2000	2100		USA, KWHR Naalehu HI	17510as			
2000	2100		USA, WBCQ Monticello ME	7415na			
2000	2100		USA, WEWN Birmingham AL	11875na	13615na	15745eu	
2000	2100		USA, WHRA Greenbush ME	17650af			
2000	2100		USA, WHRI Noblesville IN	5745va	9495am		
2000	2100		USA, WINB Red Lion PA	13570am			
2000	2100		USA, WJCR Upton KY	7490am	13595as		
2000	2100		USA, WMLK Bethel PA	15265eu			
2000	2100	smtwhf	USA, WRMI Miami FL	15724na			
2000	2100		USA, WRNO New Orleans LA	7395am	15420al		
2000	2100		USA, WTJC Newport NC	9370na			
2000	2100		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na
2000	2100		USA, WWFV McCaysville GA	12172va			
2000	2100	mtwhf	USA, WWFV McCaysville GA	9320va			
2000	2100		USA, WYFR Okeechobee FL	17845af	18980eu		
2000	2100	vl	Vanuatu, Radio	3945do	4960do	7260do	
2000	2100		Zambia, Christian Voice	4965do			
2000	2100	vl	Zambia, National BC Corp	6165do	6265do		
2000	2100	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
2000	2100		USA, WSHB Cypress Crk SC	15665va	18910af		
2010	2030		Vatican City, Vatican Radio	9660af	11625af	13765af	
2025	2045		Italy, RAI International	7125af	9635af	11880af	
2030	2045	vl	Libya, Voice of Africa	11815af	15435af	17725af	
2030	2045		Thailand, Radio	9655eu	9680eu	11905eu	
2030	2057		Vietnam, Voice of	9730eu	11630al	13740eu	
2030	2100	th	Belarus, R Belarus International	7105eu	7210eu		
2030	2100		Cuba, Radio Havana	13660eu	13750eu		
2030	2100		Ecuador, HCJB	17660eu	21455usb		
2030	2100		Egypt, Radio Cairo	15375af			
2030	2100		S Africa, Adv World Radio Africa	9745af			
2030	2100		Turkey, Voice of	7170as			
2030	2100	f	UK, Wales Radio Intl/Merlin	7325eu			
2030	2100		USA, Voice of America	6035af	6095me	7375af	7415af
			9760af	9770af	11975af	15410af	15445af
			15580af	17745af	17895af		
2030	2100	as	USA, Voice of America	4950af			
2030	2100		Uzbekistan, Radio Tashkent	9540eu	9545eu		
2045	2100		India, All India Radio	7150au	7410eu	9650eu	9910au
			9950eu	11620au	11715au		
2051	2100		New Zealand, R New Zealand Int	17675pa			

2100 UTC - 5PM E / 4PM C / 2PM P

2100	2110		Kenya, Kenya BC Corp	4935do			
2100	2115		Egypt, Radio Cairo	15375af			
2100	2130	vl	Australia, ABC/Alice Springs	2310do			
2100	2130	vl	Australia, ABC/Katherine	2485do			
2100	2130	vl	Australia, ABC/Tennant Creek	2325do			
2100	2130		Australia, Radio	7240pa	9500as	9580va	9660pa
			11880va	12080pa	17715va	21740va	
2100	2130		Austria, AWR Europe	15165af			
2100	2130		China China Radio International	5965eu	9840eu	11735af	13640af
2100	2130		Cuba, Radio Havana	13660eu	13750eu		
2100	2130		South Korea, R Korea Intl	3975eu	15575eu		
2100	2130		Turkey, Voice of	7170as			
2100	2130	as	UK, BBC World Service	5975am			
2100	2145		Germany, Deutsche Welle	9670pa	9765pa	9875af	11865af
			11915pa	15135af			
2100	2145		USA, WYFR Okeechobee FL	13855af	15120af	17845af	18980eu
2100	2156		Romania, R Romania International	9725eu	11740eu	11940eu	15365eu
2100	2200		Angola, R. Nacional de Angola	3374va	4950va	7245va	
2100	2200		Anguilla, Caribbean Beacon	11775am			
2100	2200		Australia, Christian Voice	9865pa			
2100	2200	vl	Botswana, Radio	3356do	4820do		
2100	2200		Bulgaria, Radio	9400eu	11900eu		
2100	2200		Canada, CBC Northern Service	9625do			
2100	2200		Canada, CFRX Toronto ON	6070do			
2100	2200		Canada, CFVP Calgary AB	6030do			
2100	2200		Canada, CHNX Halifax, NS	6130do			
2100	2200		Canada, CKZN St John's NF	6160do			
2100	2200		Canada, CKZU Vancouver BC	6160do			
2100	2200		Costa Rica, R for Peace Intl	15049irr	21815usb		
2100	2200		Costa Rica, University Network	5030am	6150am	7375am	9724sa
			11870am	13749na	17645as		
2100	2200		Ecuador, HCJB	17660eu	21455usb		
2100	2200	mtwhf	Eqt Guinea, Radio Africa	15185af			
2100	2200	f/monthly	Finland, Scandv Weekend Radio	11720va			
2100	2200	vl	Ghana, Ghana BC Corp	3366do	4915do		
2100	2200		India, All India Radio	7150au	7410eu	9650eu	9910au
			9950eu	11620au	11715au		
2100	2200	vl	Italy, Italian Radio Relay Service	3985va			
2100	2200		Japan, Radio	6035pa	6155eu	6180eu	11830eu
			11855af	17825na	17860pa	21670pa	
2100	2200	vl	Lesotho, Radio	4800do			
2100	2200	vl	Liberia, ELWA	4760do			
2100	2200	vl	Liberia, R Liberia International	5100do			
2100	2200		Namibia, Namibian BC Corp	3270af	3289af		
2100	2200		New Zealand, R New Zealand Int	17675pa			
2100	2200		New Zealand, ZLXA	3935do	7290do		
2100	2200	vl	Nigeria, Radio/Enugu	6025do			
2100	2200	vl	Nigeria, Radio/Ibadan	6050do			
2100	2200	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
2100	2200	vl	Nigeria, Radio/Lagos	3326do	4990do		
2100	2200	vl	Papua New Guinea, NBC	4890do			
2100	2200		Russia, World Beacon	7360eu			
2100	2200		S Africa, World Beacon	3230af	9675af	11640af	
2100	2200		Sierra Leone, Sierra Leone BS	3316do			
2100	2200	vl	Solomon Islands, SIBC	5020do	9545do		
2100	2200	as	Spain, R Exterior Espana	9595af	9840eu		
2100	2200		Sri Lanka, Sri Lanka BC Corp	4940irr			
2100	2200	vl	Syria, Radio Damascus	12085eu	13610eu		
2100	2200		UK, World Beacon	9675af			
2100	2200		Ukraine, R Ukraine International	5905eu	7410eu	11705eu	11950eu
			13590na				
2100	2200		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
			6350va	6458va	6847va	10320va	10940va
			12579va	12689va	13254va	13362va	16847va
2100	2200		USA, KAIJ Dallas TX	13815va			
2100	2200		USA, KTBN Salt Lake City UT	15590na			
2100	2200		USA, KWHR Naalehu HI	17510as			
2100	2200		USA, Voice of America	6035af	6040me	6095me	7375af
			7415as	9530af	9705as	9760eu	11870pa
			11975af	15185as	15410af	15445af	15580af
			17740as	17820as	17895af		
2100	2200	mtwhfa	USA, WBCQ Monticello ME	17495na			
2100	2200	mtwhf	USA, WBCQ Monticello ME	9335na			
2100	2200		USA, WBCQ Monticello ME	7415na			
2100	2200		USA, WEWN Birmingham AL	11875na	13615na	15745eu	
2100	2200		USA, WHRA Greenbush ME	17650af			
2100	2200		USA, WHRI Noblesville IN	5745va	9495am		
2100	2200		USA, WINB Red Lion PA	13570am			
2100	2200		USA, WJCR Upton KY	7490am	13595as		
2100	2200		USA, WRMI Miami FL	15724na			
2100	2200		USA, WRNO New Orleans LA	7395am	15420al		
2100	2200		USA, WSHB Cypress Crk SC	15665va	18910af		
2100	2200		USA, WTJC Newport NC	9370na			
2100	2200		USA, WWCR Nashville TN	9475na	12160na	13845na	15685na
2100	2200		USA, WWFV McCaysville GA	6890va			
2100	2200	mtwhf	USA, WWFV McCaysville GA	9320va			
2100	2200	vl	Vanuatu, Radio	3945do	4960do	7260do	

2100	2200		Zambia, Christian Voice	4965do			
2100	2200	vl	Zambia, National BC Corp	6165do	6265do		
2100	2200	vl	Zimbabwe, Zimbabwe BC Corp	4828do	6045do		
2115	2130	mtwhf	UK, BBC Caribbean Report	5975ca	11675ca	15390ca	
2115	2200		Egypt, Radio Cairo	9990eu	15375af		
2120	2200	s	Greece, Voice of	9425au	15650au		
2130	2145	tf	UK, BBC Calling Falklands	11680sa			
2130	2157		Czech Rep, Radio Prague Intl	11600au	15545af		
2130	2200		Albania, R Tirana International	7130eu	9540eu		
2130	2200	vl	Australia, ABC/Alice Springs	4835do			
2130	2200	vl	Australia, ABC/Katherine	5025do			
2130	2200	vl	Australia, ABC/Tennant Creek	4910do			
2130	2200		Australia, Radio	7240pa	9660pa	11880va	12080pa
				17715va	21740va		
2130	2200	mtwhf	Austria, R Austria International	5945eu	6155eu		
2130	2200		Guam, KSDA/ Adventist World R	11980as	15240as		
2130	2200		Hungary, Radio Budapest	3975eu			
2130	2200		Iran, VOIRI	9570as	13745as		
2130	2200		South Korea, R Korea Intl	15575eu			
2130	2200		Sweden, Radio	6065eu	15255as		
2130	2200		Uzbekistan, Radio Tashkent	7105eu	9540eu		
2145	2200		USA, WYFR Okeechobee FL	13855af	15120af	17845af	

2200 UTC - 6PM E / 5PM C / 3PM P

2200	2210	vl	Zambia, National BC Corp	6165do	6265do		
2200	2220	s	Greece, Voice of	9425au	15650au		
2200	2225		Italy, RAI International	9675as	11900as	15240as	
2200	2230		Canada, R Canada International	9755am	13670am	17695am	
2200	2230	mtwhf	Canada, R Canada International	15305am	17880am		
2200	2230		India, All India Radio	7150au	7410eu	9650eu	9910au
				9950eu	11620au	11715au	
2200	2230		Iran, VOIRI	9570as	13745as		
2200	2230		Mexico, R Mexico International	9705am	11770am		
2200	2230	vl	Papua New Guinea, NBC	4890do			
2200	2230	mtwhf	USA, Voice of America	5855af	6035af	7375af	7415af
				11975af			
2200	2245		Egypt, Radio Cairo	9990eu			
2200	2245		USA, WYFR Okeechobee FL	11740na	15120af	17845af	
2200	2300		Anguilla, Caribbean Beacon	6090am			
2200	2300	vl	Australia, ABC/Alice Springs	4835do			
2200	2300	vl	Australia, ABC/Katherine	5025do			
2200	2300	vl	Australia, ABC/Tennant Creek	4910do			
2200	2300		Australia, Christian Voice	9865pa			
2200	2300		Australia, Radio	15240as	17715va	17795va	21740va
2200	2300		Canada, CBC Northern Service	9625do			
2200	2300		Canada, CFRX Toronto ON	6070do			
2200	2300		Canada, CFVP Calgary AB	6030do			
2200	2300		Canada, CHNX Halifax, NS	6130do			
2200	2300		Canada, CKZN St John's NF	6160do			
2200	2300		Canada, CKZU Vancouver BC	6160do			
2200	2300		China China Radio International	7170eu			
2200	2300		Costa Rica, R for Peace Intl	15049irr	21815usb		
2200	2300		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	17645as	
2200	2300	mtwhf	Eqt Guinea, Radio Africa	15185af			
2200	2300	f/monthly	Finland, Scandv Weekend Radio	11690va			
2200	2300	vl	Ghana, Ghana BC Corp	3366do	4915do		
2200	2300	fas/vl	Italy, Italian Radio Relay Service	3985va			
2200	2300	vl	Liberia, R Liberia International	5100do			
2200	2300		Malaysia, Radio	7295do			
2200	2300		Namibia, Namibian BC Corp	3270af	3289af		
2200	2300		New Zealand, R New Zealand Int	17675pa			
2200	2300		New Zealand, ZLXA	3935do	7290do		
2200	2300	vl	Nigeria, Radio/Enugu	6025do			
2200	2300	vl	Nigeria, Radio/Ibadan	6050do			
2200	2300	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
2200	2300	vl	Nigeria, Radio/Lagos	3326do	4990do		
2200	2300		Sierra Leone, Sierra Leone BS	3316do			
2200	2300	vl	Solomon Islands, SIBC	5020do	9545do		
2200	2300		Sri Lanka, Sri Lanka BC Corp	4940irr			
2200	2300		Taiwan, Radio Taipei International	11565eu	15600eu		
2200	2300		Turkey, Voice of	7190va	11845va		
2200	2300		UK, BBC World Service	5965as	5975am	6175na	6195va
				7105as	9590na	9660as	11835af	11955as
				12080pa	12095sa	15400af	
2200	2300		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va	10940va
				12579va	12689va	13254va	13362va	16847va
2200	2300		USA, KAIJ Dallas TX	13815va			
2200	2300		USA, KTBN Salt Lake City UT	15590na			
2200	2300		USA, KWHR Naalehu HI	17510as			
2200	2300		USA, Voice of America	7215as	9705as	9770as	11760as
				15185as	15290as	15305as	17740as	17820as
2200	2300	mtwhf	USA, WBCQ Monticello ME	9335na			
2200	2300		USA, WBCQ Monticello ME	7415na			
2200	2300		USA, WEWN Birmingham AL	9385na	9975eu	13615na	
2200	2300		USA, WHRA Greenbush ME	7580eu			
2200	2300		USA, WHRI Noblesville IN	5745va	9495am		
2200	2300		USA, WINB Red Lion PA	13570am			
2200	2300		USA, WJCR Upton KY	7490am	13595as		
2200	2300as	USA, WRMI	Miami FL	9955am			
2200	2300		USA, WRNO New Orleans LA	7395am	15420al		
2200	2300		USA, WSHB Cypress Crk SC	13770eu	15285sa		
2200	2300		USA, WTJC Newport NC	9370na			
2200	2300		USA, WWCR Nashville TN	7435na	9475na	12160na	13845na
2200	2300		USA, WWFV McCaysville GA	5085va	6890va		
2200	2300	vl	Vanuatu, Radio	3945do	4960do	7260do	
2200	2300		Zambia, Christian Voice	4965do			
2230	2257		Czech Rep, Radio Prague Intl	11600na	15445na		
2230	2300		Belgium, RVI Flanders R Intl	15565na			
2230	2300		Canada, R Canada International	9755am	13670am	17695am	
2230	2300		Cuba, Radio Havana	9550am			
2230	2300	vl	Papua New Guinea, NBC	4890do	11880irr		
2230	2300	vl/as	Solomon Islands, SIBC	5020do			
2230	2300	vl/a	Solomon Islands, SIBC	9545do			
2245	2300		India, All India Radio	9705as	9950as	11620as	13605as
2245	2300		USA, WYFR Okeechobee FL	11740na			

2300 UTC - 7PM E / 6PM C / 4PM P

2300	0300	sm f	USA, WINB Red Lion PA	12160am			
2300	0000		Anguilla, Caribbean Beacon	6090am			
2300	0000	vl	Australia, ABC/Alice Springs	4835do			
2300	0000	vl	Australia, ABC/Katherine	5025do			
2300	0000	vl	Australia, ABC/Tennant Creek	4910do			
2300	0000		Australia, Christian Voice	9865pa			
2300	0000		Australia, Radio	9660pa	12080pa	17715va	17795va
				21740va			
2300	0000		Bulgaria, Radio	9400na	11700na		
2300	0000	vl	Cameroon, CRTV Radio Buea	6005do			
2300	0000		Canada, CBC Northern Service	9625do			
2300	0000		Canada, CFRX Toronto ON	6070do			
2300	0000		Canada, CFVP Calgary AB	6030do			
2300	0000		Canada, CHNX Halifax, NS	6130do			
2300	0000		Canada, CKZN St John's NF	6160do			
2300	0000		Canada, CKZU Vancouver BC	6160do			
2300	0000		China China Radio International	5990na			
2300	0000		Costa Rica, R for Peace Intl	15049irr	21815usb		
2300	0000		Costa Rica, University Network	5030am	6150am	7375am	9724sa
				11870am	13749na	17645as	
2300	0000		Ecuador, HCJB	17660as			
2300	0000		Egypt, Radio Cairo	9900am			
2300	0000	f/monthly	Finland, Scandv Weekend Radio	11690va			
2300	0000	vl	Ghana, Ghana BC Corp	3366do	4915do		
2300	0000		India, All India Radio	9705as	9950as	11620as	13605as
2300	0000	vl	Liberia, R Liberia International	5100do			
2300	0000		Malaysia, Radio	7295do			
2300	0000		Malaysia, RTM Kota Kinabalu	5980do			
2300	0000		Namibia, Namibian BC Corp	3270af	3289af		
2300	0000		New Zealand, R New Zealand Int	17675pa			
2300	0000		New Zealand, ZLXA	3935do	7290do		
2300	0000	vl	Papua New Guinea, NBC	4890do	11880irr		
2300	0000		Sierra Leone, Sierra Leone BS	3316do			
2300	0000		Singapore, SBC Radio One	6150do			
2300	0000	vl/as	Solomon Islands, SIBC	5020do			
2300	0000	vl/a	Solomon Islands, SIBC	9545do			
2300	0000		Sri Lanka, Sri Lanka BC Corp	4940do			
2300	0000		UK, BBC World Service	3915as	5965as	5975am	6035as
				6175na	6195as	7105as	9590na	11945as
				11955as	12095sa	15280as	
2300	0000		USA, Armed Forces Radio	4278va	4319va	4993va	5765va
				6350va	6458va	6847va	10320va	10940va
				12579va	12689va	13254va	13362va	16847va
2300	0000		USA, KAIJ Dallas TX	13815va			
2300	0000		USA, KTBN Salt Lake City UT	15590na			
2300	0000		USA, KWHR Naalehu HI	17510as			
2300	0000		USA, VOA Special English	7190as	7200as	9545as	11805pa
				11925as	13735as	13775as	15205pa
2300	0000		USA, Voice of America	7215as	9705as	9770as	11760as
				15185as	15290as	15305as	17740as	17820as
2300	0000		USA, WBCQ Monticello ME	7415na			
2300	0000	smtwhf	USA, WBCQ Monticello ME	9335na			
2300	0000		USA, WEWN Birmingham AL	9385na	9975eu	13615na	
2300	0000		USA, WHRA Greenbush ME	7580eu			
2300	0000		USA, WHRI Noblesville IN	5745va	9495am		
2300	0000		USA, WINB Red Lion PA	13570am			
2300	0000		USA, WJCR Upton KY	7490am	13595as		
2300	0000		USA, WRMI Miami FL	9955am			
2300	0000		USA, WRNO New Orleans LA	7355va			
2300	0000		USA, WSHB Cypress Crk SC	13770eu	15285sa		
2300	0000		USA, WTJC Newport NC	9370na			
2300	0000	as	USA, WWBS Macon GA	11910na			
2300	0000		USA, WWCR Nashville TN	7435na	9475na	12160na	13845na
2300	0000		USA, WWFV McCaysville GA	5085va	6890va		
2300	0000	vl	Vanuatu, Radio	3945do	4960do	7260do	
2300	0000		Zambia, Christian Voice	4965do			
2300	2305	vl	Nigeria, Radio/Enugu	6025do			
2300	2305	vl	Nigeria, Radio/Ibadan	6050do			
2300	2305	vl	Nigeria, Radio/Kaduna	4770do	6090do	7275do	9570do
2300	2305	vl	Nigeria, Radio/Lagos	3326do	4990do		
2300	2330	mtwhf	Canada, R Canada International	6040am	11865am	15305am	
2300	2330		Cuba, Radio Havana	9550am			
2300	2330	mtwhf	Mexico, R Mexico International	9705am	11770am		
2300	2345		Germany, Deutsche Welle	9815as	12055as	13610as	21790as
2300	2345		USA, WYFR Okeechobee FL	11740na			
2300	2356		Romania, R Romania International	9750eu	11775eu	11940na	15105na
2300	2359		Canada, R Canada International	9755am	13670am	17695am	
2330	0000		Canada, R Canada International	5960am	9755am	13670am	17695am
2330	0000		Malaysia, RTM Sarawak	7160do			
2330	0000		Netherlands, Radio	6165na	9845na		
2330	0000		Switzerland, Swiss R International	9885sa	11905sa		
2330	0100		Lithuania, Radio Vilnius	9875na			
2330	2345	vl	Libya, Voice of Africa	11815af	15435af	17725af	
2330	2357		Vietnam, Voice of	12019as	15115as		

Selected Shortwave Guide Programming

MT

0000 UTC - Page 43 Freqs

Sunday

0000 R. Netherlands — Aural Tapestry (David Swatling weaves threads from different cultures and periods of history to tell interesting stories.)
0005 R. Australia — The Europeans (historical and cultural perspectives on European societies.)
R. Prague — Readings from Czech Literature
0010 R. Japan — Hello from Tokyo (listener letters, music and short features)
R. Prague — Saturday Music (Czech classical, folk, jazz or rock music)
R. New Zealand Int. — The Week in Parliament (a weekly roundup of NZ political news)
0030 R. Australia — Educational series (a series of documentary programs dealing with Asian or Pacific history, politics or communcations. Specific details were unavailable at deadline.)
R. Netherlands — Roughly Speaking (European youth lifestyles magazine)
R. New Zealand Int. — Spectrum (a weekly look at the people, places and events around NZ)

Monday-Friday

0000 R. New Zealand Int. — Midday Report (news updates and in-depth reports)

Monday

0000 R. Netherlands — Dutch Horizons (Bertine Krol chronicles life in Holland)
WBCQ(7415kHz.) — Radio New York International (Johnny Lightning plays classic rock.)
WWCR(3215kHz.) — World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting.)
0010 R. Australia — Awaye! (Produced and presented by Aboriginal broadcasters, this is Australia's only national indigenous arts and culture program.)
R. Japan — Weekend Square (A program designed to present various aspects of Japan in a friendly and relaxed atmosphere with interviews, music and discussions.)
0030 BBCWS(am) — The World Today (the BBC's agenda-setting flagship global news program)
R. Netherlands — Aural Tapestry (David Swatling weaves threads from different cultures and periods of history to tell interesting stories.)
0045 R. Exterior de Espana — Radio Club (a repeat of Saturday's 0035 program.)

Tuesday-Saturday

0000 R. Exterior de Espana — REE's News Service (featuring international, Ibero-American and national news in-depth, a review of the Spanish press, commentaries and analyses)
VOA — News Now (the VOA's continuous rolling news service with analysis, sports, business reports and topical features)
0015 R. Japan — 44 Minutes (daily current affairs magazine about Japan and Asia)
0045 R. Exterior de Espana — Spanish Language Course

Tuesday

0000 R. Netherlands — The Research File (a magazine emphasizing the relevance of science to all our lives)
0005 BBCWS(am) — Meridian-Masterpiece (critical examinations of creative endeavors)
0010 R. Australia — The Science Show (one of the longest running programs on ABC Radio)
0030 BBCWS(am) — The Music Mix (insights into current popular music)[5th & 12th—Club Culture—Claire Smith takes an in-depth look at the world of popular dance music from backroom boys to the superstar DJs and producers.]
R. Netherlands — Euroquest (a magazine placing Europe in context)

Wednesday

0000 R. Netherlands — Music 52/15 (Martha Hawley presents musical styles from around the globe)
0005 BBCWS(am) — Meridian-Screen (interviews, documentaries, features and discussions on the film arts)
0010 R. Australia — The National Interest (Terry Lane's round-up of the week's major issues)
0030 R. Netherlands — A Good Life (how development affects societies)

Thursday

0000 R. Netherlands — The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)
0005 BBCWS(am) — Music Review (Natalie Wheen presents personalities, views and issues from the international music scene.)
0010 R. Australia — Background Briefing (ABC Radio's award-winning agenda-setting, current affairs radio documentary program)
0030 BBCWS(am) — Westway (a twice-weekly radio soap opera)
R. Netherlands — Dutch Horizons (Bertine Krol chronicles life in Holland.)

Friday

0000 R. Netherlands — The Basement Sessions (RN's jazz expert Hans Mantel presents the best classic jazz recordings from the RN archives.)
0005 BBCWS(am) — Meridian-Writing (reports on books, theatre, poetry, journalism, biography, history and anthropology)
0010 R. Australia — Hindsight (Australian social history woven from the memories of those who were there)
0030 BBCWS(am) — Charlie Gillett (presents his selection of music from around the globe)
R. Netherlands — The Research File (a magazine emphasizing the relevance of science to all our lives)

Saturday

0000 R. Netherlands — A Good Life (how development affects societies)
0000 R. New Zealand Int. — RNZ News
0005 BBCWS(am) — Omnibus (a weekly documentary feature program that tackles any topic across the globe)
R. Australia — Feedback (Roger Broadbent answers listener questions and provides regular updates about RA)
0010 R. New Zealand Int. — Focus on Politics (a report on government and politics in NZ)
0030 BBCWS(am) — Westway (a radio soap opera)
R. New Zealand Int. — The Sampler (Nick Bollinger casts a critical ear over the latest CD offerings)
R. Netherlands — The Weekly Documentary (See Thursday 0000 listing for details.)
0033 VOA News Now — Press Conference USA ('Meet the Press' for shortwave)
0035 R. Exterior de Espana — Radio Club (answering listeners' letters)
0045 BBCWS(am) — Revolver (a guest musical artist gives a personal view on a selection of the best new releases from country to techno)
R. Exterior de Espana — Radio Waves (a weekly program for radio enthusiasts)

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Daily

0130 R. Austria Int. — Report from Austria (a daily magazine focusing on Austria and central and eastern Europe)

Sunday

0100 BBCWS(am) — The World Today (the BBC's agenda-setting flagship global news program)
WBCQ — Marion's Attic (a treasure trove of rare and vintage recordings presented by Marion Webster)
0105 Deutsche Welle — Talking Point (European journalists discuss the week's events)
R. Australia — Correspondents' Report (ABC News reporters background international events)
R. Canada Int. — Canada Newsweek (the past week in Canada)
R. Netherlands — Europe Unzipped (the events of the past week in Europe, some unusual)
R. New Zealand Int. — Bookmarks (NZ books, literature and writers)
R. Prague — Readings from Czech Literature
0110 HCJB Ecuador — DX Partyline (Allen Graham hosts a weekly program for DXers and SWLs)
R. Prague — Saturday Music (Czech classical, folk, jazz or rock music)
Swiss R. Int. — The Name Game (prizes are offered to listeners who can identify the mystery Swiss location described)[1st Sun. of the month]
0111 Voice of Russia — News and Views (Russian views on news developments)
0115 Deutsche Welle — Inside Europe (a weekly magazine exploring the topical issues shaping the continent)
0120 China R. Int. — In the Spotlight (Chinese arts and cultural magazine)
0130 R. New Zealand Int. — Future Indicative (a magazine for disabled persons)
0130 BBCWS(am) — Reporting Religion (Jane Little presents the week's main religious news.)
0130 R. Canada Int. — Canada Review (a business and technology edition of RCI's weekend magazine)
RTE Ireland — Sportsnews (reports and accounts on the weekend's events)
0132 Voice of Russia — Moscow Yesterday and Today (recalling the most interesting events in the history of the city)
0135 R. Austria Int. — Radio E (A weekly magazine on Europe jointly produced by the BBC and other European broadcasters.)
R. Habana Cuba — DXers Unlimited (Arnie Coro presents a program from radio enthusiasts)
Swiss R. Int. — (repeat broadcast of the 0110 program)
0145 BBCWS(am) — Letter from America (Alistair Cooke's weekly commentary on life in the USA)

Monday-Friday

0105 R. New Zealand Int. — Cadenza (light classical music selections)
0110 R. Australia — Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)

Monday

0100 R. Habana Cuba — Weekly Review (Cuba's perspective on current events)
WBCQ(7415kHz.) — Radio New York International (continues from 0000)
0105 BBCWS(am) — Wright Around the World (Steve Wright puts the best e-mails, letters, answer machine messages and faxes on the air while playing musical requests)
Deutsche Welle — Religion and Society (an insight into religious events around the world)
R. Budapest — Heading for Hungary (a monthly travelogue)[June 4]
And the Gatepost (listener letters)[June 11]
Spotlight (a monthly magazine)[June 18]
Europe Unlimited (Hungary's relations with the rest of Europe)[June 25]
R. Canada Int. — The Maple Leaf Mailbag (Mark Montgomery answers listener mail and hosts the fortnightly CIDX Report for dxers)
R. Netherlands — Wide Angle (a single issue examined in-depth)
0115 Deutsche Welle — Arts on the Air (Breandain O'Shea covers the German cultural scene.)
0130 China R. Int. — People in the Know (interviews with prominent Chinese who are shaping the nation's future)
R. Australia — The Health Report (Dr. Norman Swan's weekly report on health and medical issues)
R. Canada Int. — Canada Review (the arts edition of RCI's weekend magazine)
R. Habana Cuba — 40th Anniversary of RHC (special reports on the history of the station)
RTE Ireland — Sportsnews (reports and accounts on the weekend's events)
0132 Voice of Russia — Timelines (Estelle Winters' variety show giving insight into life in Moscow through foreign eyes)
0140 R. Habana Cuba — The Mailbag Show (listener letters)
0150 R. Habana Cuba — Breakthrough (Arnie Coro's weekly science report)

Tuesday-Saturday

0100 R. Exterior de Espana — REE's News Service (featuring international, Ibero-American and national news in-depth, a review of the Spanish press, commentaries and analyses)
R.Netherlands — Newsline (news, analysis and background reports)
VOA — News Now (the VOA's continuous rolling news service with analysis, sports, business reports and topical features)
0105 Deutsche Welle — Newslink (daily current affairs magazine focused on Europe
0110 R. Budapest — Hungary Today (daily magazine covering current events in Hungary)
R. Canada Int. — Canada Today (daily magazine of interviews, correspondents' reports and Canadian views on world and national events)
Voice of Russia — Commonwealth Update (comments on domestic developments and major domestic issues)
0110 HCJB Ecuador — Studio 9 (daily magazine with focused reports on Latin America)
0130 RTE Ireland — The News at Six (RTE's flagship evening news program)
0145 R. Exterior de Espana — Spanish Language Course

Tuesday

0105 BBCWS(am) — Health Matters (reports on the latest research explaining where medicine is going)
0130 China R. Int. — Sports World (comprehensive coverage of sports in China and Asia)
Deutsche Welle — Insight (a look at major international trends and developments)
0130 R. Australia — The Law Report (Damien Carrick presents breaking legal stories in Australia and overseas)
0132 Voice of Russia — Folk Box (music drawn from the traditions of the hundreds of nationalities that make up Russia and the CIS)

Wednesday

0105 BBCWS(am) — Science View (informed comment and analysis on the worlds of science and technology)
0130 BBCWS(am) — Focus on Faith (Trevor Barnes looks at the religious stories behind the news.)
Deutsche Welle — Man and Environment (John Hay presents the human element in environmental issues.)
R. Australia — The Religion Report (John Cleary examines the way religion and societies interact.)
0132 Voice of Russia — The Jazz Show (recordings from the Russian world of jazz)
0140 R. Habana Cuba — DXers Unlimited (Arnie Coro presents a program from radio enthusiasts.)

Thursday

0105 BBCWS(am) — Sports International (the issues and personalities behind the headlines)[Focus on Football, presenting features, interviews and analysis of the globe's most popular game, airs the first week of the month.]
0130 Deutsche Welle — Living in Germany (people, places and events in Germany)
HCJB Ecuador — Ham Radio Today (Graham Bulmer hosts a program for radio amateurs.)
R. Australia — The Media Report (Mick O'Regan takes a critical look at the latest developments in the communications industry.)

Friday

0105 BBCWS(am) — One Planet (stories about the environment, development, agriculture and human impact on the natural world)[Parts 2 and 3 of three special editions of this program, focusing on how Britain's changing environmental policy is affecting in-

dividuals and communities, will air during the first two weeks of the month.]
0115 Deutsche Welle — Hard to Beat—The World of Sport (weekly report on German and European sport)
0130 BBCWS(am) — People and Places (a forum for the exchange of views and experiences on a global scale)[This month, the last four programs in the ten-part series, True Lives, which invites listeners to identify the issues you think are the most important affecting lives in the 21st century. E-mail <jenny.waters@bbc.co.uk> or write Room 607SE, Bush House, London.]
0130 R. Australia — The Sports Factor (Amanda Smith presents reports which debate and celebrate the cultural significance of sport.)

Saturday
0105 BBCWS(am) — Discovery (in-depth exploration of ideas and discoveries in science and technology)
0105 R. Australia — Asia-Pacific Weekend Edition (a weekly current events and business report for and about Asia and the Pacific region)
0105 R. New Zealand Int. — Home Grown (Liz Barry plays contemporary Kiwi music)
0130 BBCWS(am) — Essential Guide (the biggest developments, issues and names in global affairs)[This month, the last three parts of the four program series, Block on Block, in which Richard Fenby explores the ingenuity of the builders of great structures, past and present, by investigating tunnels, towers and bridges.]
0130 Deutsche Welle — German by Radio (a language lesson)
HCJB Ecuador — Musica del Ecuador (Jorge Zambrano presents selections of Ecuadorian and Andean music)
R. Australia — Arts Talk (Julie Copeland presents the world of arts and cultural ideas)
R. New Zealand Int. — Musical Chairs (the music and background of a featured NZ musician)
0133 VOA — Communications World (Kim Elliott reviews the week in global communications)
0135 R. Exterior de Espana — Radio Club (answering listeners' letters)
0145 R. Exterior de Espana — Radio Waves (a weekly program for radio enthusiasts)

0200 UTC - Page 44 Freqs

Sunday
0200 BBCWS(am) — The World Today (the BBC's agenda-setting flagship global news program)
HCJB Ecuador — Ham Radio Today (Graham Bulmer hosts a program for radio amateurs.)
WWCR(5070kHz.) — Communications World (Kim Elliott reviews the week in global communications)
0205 R. Australia — Margaret Throsby (A guest is interviewed and presents favorite musical pieces.)
0205 R. New Zealand Int. — Eureka! (reports on science in NZ)
0211 Voice of Russia — Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow.)
0215 R. Taipei Int. — Great Wall Forum (the China-Taiwan issue from Taipei's perspective)
0230 BBCWS(am) — From Our Own Correspondent (the background to international events from BBC correspondents around the world)
R. Sweden — Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)
Sweden Today (George Wood presents the voices of Sweden, the second week of the month)
Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)
Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)
WWCR(5070kHz.) — World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)
0232 Voice of Russia — Songs from Russia (melodies and musical novelties from Russia's past)
0235 R. Habana Cuba — The World of Stamps (This just might be the only program on radio on philatelic matters.)
0240 Swiss R. Int. — The Name Game (prizes are offered to listeners who can identify the mystery Swiss location described)[1st Sun. of the month]
0245 R. Habana Cuba — 40th Anniversary of RHC (special reports on the history of the station)

Monday-Friday
0205 R. New Zealand Int. — In Touch with New Zealand (a domestic afternoon variety program hosted by Wayne Mowat)
0210 R. Australia — The World Today (a comprehensive current affairs program with Monica Attard and John Highfield)
0245 R. Taipei Int. — Let's Learn Chinese

Monday
0200 BBCWS(am) — The World Today (the BBC's agenda-setting flagship global news program)
R. Habana Cuba — From Havana (a showcase of contemporary Cuban music and musicians)
WBCQ(7415kHz.) — Radio New York International (continues from 0000)
0211 Voice of Russia — Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow)
0215 R. Taipei Int. — Jade Bells and Bamboo Pipes (Carson Wong introduces selections of traditional Chinese music)
0230 BBCWS(am) — Assignment (documentaries that delve behind the headlines to find out how news events affect people's everyday lives)
0230 R. Habana Cuba — The Jazz Place (the very best of Cuban jazz)
R. Sweden — In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström)
Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first.)
0232 Voice of Russia — This is Russia (the cities and regions, culture and the arts, the countryside, religion and people)
0235 R. Budapest — Heading for Hungary (a monthly travelogue)[June 4]
And the Gatepost (listener letters)[June 11]
Spotlight (a monthly magazine)[June 18]
Europe Unlimited (Hungary's relations with the rest of Europe)[June 25]

Tuesday-Saturday
0230 R. Sweden — Sixty Degrees North (reports, interviews and analysis on the Nordic region)
0230 BBCWS(am) — World Business Report (a guide through the main business issues of the day)
0235 R. Budapest — Hungary Today (a daily magazine covering current events in Hungary)

Tuesday
0211 Voice of Russia — Science and Engineering (reports on the latest developments in science and technology)
0232 Voice of Russia — Kaleidoscope (the latest economic, social and cultural events in Russia and the CIS)
0245 BBCWS(am) — Analysis (background to the stories in the news)

Wednesday
0200 HCJB Ecuador — The Book and the Spade (the latest discoveries and developments in Biblical archaeology)
0211 Voice of Russia — Newmarket (news about business in Russia and Russia's involvement in international business)
0245 BBCWS(am) — Analysis (background to the stories in the news)
0245 R. Sweden — Media Scan (the oldest program of its kind, George Wood now concentrates on satellite and cyberspace communications every first and third week)

Thursday
0211 Voice of Russia — Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow.)
0215 R. Taipei Int. — Journey into Chinese Culture
0232 Voice of Russia — Moscow Yesterday and Today (recalling the most interesting events in the history of the city)
0245 BBCWS(am) — From Our Own Correspondent (the background to international events from BBC correspondents around the world)
0245 R. Sweden — Money Matters (a weekly economic report on the Nordic region)

Friday
0211 Voice of Russia — Science and Engineering (reports on the latest developments in science and technology)
0232 Voice of Russia — Russian by Radio (a language lesson)
0245 BBCWS(am) — Analysis (background to the stories in the news)
0245 R. Sweden — Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)
Greenscan (Azariah Kiros highlights Swedish environmental awareness and challenges the second week of the month)
Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)
The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)

Saturday
0205 R. Australia — Ockham's Razor (sharp commentaries on scientific issues)
0211 Voice of Russia — Newmarket (news about business in Russia and Russia's involvement in international business)
0230 R. Australia — Earthbeat (Alexandra DeBlas presents a program on environmental science)
0232 Voice of Russia — Audio Book Club (readings from the best of Russian classic and contemporary literature)
0245 BBCWS(am) — Analysis (background to the stories in the news)
0245 R. Taipei Int. — Let's Learn Chinese

0300 UTC - Page 44 Freqs

Sunday
0300 WHRI(5745kHz.) — Dxing with Cumbre (Marie Lamb with the hottest DX catches)
0305 R. Australia — Feedback (Roger Broadbent answers listener questions and provides regular updates about RA)
R. Prague — Readings from Czech Literature
0310 R. Prague — Saturday Music (Czech classical, folk, jazz or rock music)
0315 Deutsche Welle — Spectrum (a weekly program looking at developments in the fields of science and technology)
0320 China R. Int. — In the Spotlight (Chinese arts and cultural magazine)
0330 BBCWS(am) — Science in Action (Richard Black reports news from the worlds of science and technology)
R. Australia — Ockham's Razor (sharp commentaries on scientific issues)
R. Sweden — Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)
Sweden Today (George Wood presents the voices of Sweden, the second week of the month)
Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)
Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)
0332 Voice of Russia — Kaleidoscope (the latest economic, social and cultural events in Russia and the CIS)
0335 R. Habana Cuba — DXers Unlimited (Arnie Coro presents a program from radio enthusiasts)

Monday
0300 R. Habana Cuba — Weekly Review (Cuba's perspective on current events)
WBCQ(7415kHz.) — Radio New York International (continues from 0000)
0305 BBCWS(am) — Counterpoint (Ned Sherrin presents a general knowledge music quiz)
R. New Zealand Int. — Tagata o te Moana (Anita Purcell presents a weekly Pacific magazine with NZ and regional Pacific news, issues, information and music.)
0315 Deutsche Welle — Arts on the Air (Breandain O'Shea covers the German cultural scene.)
0330 BBCWS(am) — Westway Compilation (an opportunity to hear again both episodes of this radio soap opera broadcast last week)
China R. Int. — People in the Know (interviews with prominent Chinese who are shaping the nation's future)
R. Habana Cuba — 40th Anniversary of RHC (special reports on the history of the station)
R. Sweden — In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström)
Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first.)
0332 Voice of Russia — Audio Book Club (readings from the best of Russian classic and contemporary literature)
0340 R. Australia — The Australian Music Show (the latest rock music from the Triple J youth network of the ABC)
R. Habana Cuba — The Mailbag Show (listener letters)
0350 R. Habana Cuba — Breakthrough (Arnie Coro's weekly science report)

Tuesday-Saturday
0305 Deutsche Welle — Newslink (daily current affairs magazine focused on Europe)
0311 Voice of Russia — News and Views (Russian views on news developments)
0330 R. Sweden — Sixty Degrees North (reports, interviews and analysis on the Nordic region)
0345 BBCWS(am) — Off the Shelf (abridged serialized readings of novels, stories and other literature)

Tuesday
0305 BBCWS(am) — Counterpoint (Ned Sherrin presents a general knowledge music quiz)
0315 Radio Taipei Int. — Taiwan Economic Journal
0330 China R. Int. — Sports World (the sports scene in China and Asia)
Deutsche Welle — Insight (a look at major international trends and developments)
0340 R. Australia — Music Deli (Australian performances of folk, acoustic, traditional and world music)

Wednesday
0305 BBCWS(am) — John Peel (an eclectic mix of music)
0330 BBCWS(am) — Patterns of Faith (a global exploration of religious values and human wisdom)
Deutsche Welle — Man and Environment (John Hay presents the human element in environmental issues.)

Shortwave Guide

R. New Zealand Int. Tradewinds (Walter Zweifel with a weekly report on Pacific regional business and economic news and features)
0340 R. Australia Blacktracker (Mal Honess presents contemporary Aboriginal music.)
R. Habana Cuba DXers Unlimited (Arnie Coro presents a program from radio enthusiasts)
0345 R. Sweden Media Scan (The oldest program of its kind, George Wood now concentrates on satellite and cyberspace communications every first and third week.)

Thursday

0305 BBCWS(am) The Greenfield Collection (Edward Greenfield plays classical music requests and selections drawn from his own collection)
R. New Zealand Int. RNZI Talk (a fortnightly introduction to the RNZI and National Radio staff, along with RNZI developments, projects and programmes)
Mailbox (a fortnightly program aimed at the serious shortwave listener, with Myra Oh answering letters, Paul Ormandy reporting the latest DX news, and Frequency Manager Adrian Sainsbury answering technical questions)
0330 BBCWS(am) Language Steamrollers (Sarah Griffith traces how thousands of languages have been "steamrollered" out of existence by the handful of language groups that dominate the world today.)
Deutsche Welle Living in Germany (people, places and events in Germany)
R. New Zealand Int. The World in Sport (Dmitri Edwards presents highlights of the world's sporting week with emphasis on NZ and the Pacific.)
0340 R. Australia Oz Country Style (country music from Australia)
0345 R. Sweden Money Matters (a weekly economic report on the Nordic region)

Friday

0305 BBCWS(am) Music Live Concerts (The BBC kicks off its Music Live 2001 series with eight weekly live jazz performances from around Britain.)
R. New Zealand Int. Dateline Pacific (the major Pacific stories of the week, with background and reaction from the people making the news,presented by Don Wiseman)
0330 BBCWS(am) Heart and Soul (global religious and spiritual experiences)
China R. Int. Life in China (a weekly magazine focusing on the lives of ordinary people in China)
Deutsche Welle Hard to Beat: The World of Sport (weekly report on German and European sport)
R. New Zealand Int. Pacific Correspondent (RNZI's regional correspondents talk to Don Wiseman about political and social issues in their respective Pacific countries)
0340 R. Australia Music Deli (Australian performances of folk, acoustic, traditional and world music)
0345 R. Sweden Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)
Greenscan (Azariah Kiros highlights Swedish environmental awareness and challenges the second week of the month)
Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)
The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)

Saturday

0305 R. Australia Rural Reporter (ABC's rural reporters present news and stories from rural and regional Australia)
0330 BBCWS(am) Write On (Penny Vine sifts through the listener mail)
From Where I Stand (audio diaries about modern British society)[aired the second or third week of the month in place of Write On]
0330 Deutsche Welle German by Radio (a language lesson)
HCJB Ecuador Inspirational Classics (classical music selections inspired by religious and spiritual themes)
0332 R. Australia Educational series (a series of documentary programs dealing with Asian or Pacific history, politics or communcations. Specific details were unavailable at deadline.)

0400 UTC - Page 45 Freqs

Daily

0400 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)

Sunday

0400 R. Vlaanderen Int. Music from Flanders (a half-hour of Flemish music, musicians and musical performances)
0405 R. Australia Pacific Focus-Arts (reports on culture and the arts in the Pacific region)
0410 HCJB Ecuador DX Partyline (Allen Graham hosts a weekly program for DXers and SWLs)
0415 Swiss R. Int. The Name Game (prizes are offered to listeners who can identify the mystery Swiss location described)[1st Sun. of the month]
0420 China R. Int. In the Spotlight (Chinese arts and cultural magazine)
0430 BBCWS(am) Global Business (Peter Day charts the transformations sweeping through the world of work and commerce.)
R. Australia Arts Talk (Julie Copeland presents the world of arts and cultural ideas)
WHRI(5745kHz.) Dxing with Cumbre (Marie Lamb with the hottest DX catches)
0432 Voice of Russia Moscow Yesterday and Today (recalling the most interesting events in the history of the city)
0435 R. Habana Cuba The World of Stamps (This just might be the only program on radio on philatelic matters.)
R. Netherlands Europe Unzipped (the events of the past week in Europe, some unusual)
0445 R. Habana Cuba 40th Anniversary of RHC (special reports on the history of the station)
Swiss R. Int. (repeat of the 0415 program)

Monday-Friday

0400 WBCQ Amos 'n Andy (the classic radio comedy from America's radio past)
0410 R. Australia Margaret Throsby (a guest is interviewed and presents favorite musical pieces)

Monday

0400 R. Vlaanderen Int. Radio World (Frans Vossen presents a weekly report about international radio.)
R. Habana Cuba From Havana (a showcase of contemporary Cuban music and musicians)
0430 China R. Int. People in the Know (interviews with prominent Chinese who are shaping the nation's future)
R. Habana Cuba The Jazz Place (the very best of Cuban jazz)
0432 Voice of Russia The Jazz Show (recordings from the Russian world of jazz)
0435 R. Netherlands Sincerely Yours (Howard Shannon and Neville Powis host RN's listener response program.)

Tuesday-Saturday

0410 HCJB Ecuador Studio 9 (daily magazine with focused reports on Latin America)
0430 R.Netherlands Newsline (news, analysis and background reports)

Tuesday

0411 Voice of Russia Moscow Mailbag (VOR's top-rated program in which Joe Adamov answers listener questions and talks about the latest rumors and jokes sweeping Moscow)
0430 China R. Int. Sports World (the sports scene in China and Asia)

Wednesday

0411 Voice of Russia Science and Engineering (reports on the latest developments in science and technology)

Thursday

0411 Voice of Russia Newmarket (news about business in Russia and Russia's involvement in international business)
0430 HCJB Ecuador Ham Radio Today (Graham Bulmer hosts a program for radio amateurs.)
0432 Voice of Russia Folk Box (music drawn from the traditions of the hundreds of nationalities that make up Russia and the CIS)

Friday

0411 Voice of Russia Moscow Mailbag (See Tuesday's 0511 listing.)
0430 China R. Int. Life in China (a weekly magazine focusing on the lives of ordinary people in China)
0432 Voice of Russia Audio Book Club (readings from the best of Russian classic and contemporary literature)

Saturday

0400 WBCQ Amos 'n Andy (the classic radio comedy from America's radio past)
0405 R. Australia Pacific Focus-Environment (the past week's environmental news as reported on the weekday magazine, Pacific Beat)
0411 Voice of Russia Science and Engineering (reports on the latest developments in science and technology)
0430 HCJB Ecuador Musica del Ecuador (Jorge Zambrano presents selections of Ecuadorian and Andean music)
0432 Voice of Russia Timelines (Estelle Winters' variety show giving insight into life in Moscow through foreign eyes)

0500 UTC - Page 45 Freqs

Sunday

0500 R. Netherlands Aural Tapestry (David Swatling weaves threads from different cultures and periods of history to tell interesting stories.)
0505 R. New Zealand Int. Whenua! (Maori cultural magazine)
0505 BBCWS(am) Wright Around the World (Steve Wright puts the best e-mails, letters, answer machine messages and faxes on the air while playing musical requests.)
Deutsche Welle Talking Point (European journalists discuss the week's events.)
R. Australia Pacific Focus-Sports (reports on sport in the Pacific region)
0505 Voice of Nigeria Link-Up (musical requests and dedications from around the African continent)
0510 R. Japan Pop! Goes Asia (a look at Asia as it is now, presenting the cultures and lifestyles of other Asian countries through their popular music)
0515 Deutsche Welle Marks and Markets (DW's weekly financial magazine highlighting business in Europe)
0520 China R. Int. In the Spotlight (Chinese arts and cultural magazine)
0530 R. Australia Fine Music Australia (Australian classical music performances)
0535 R. Habana Cuba DXers Unlimited (Arnie Coro presents a program from radio enthusiasts)

Monday-Friday

0500 Voice of Nigeria Wave Train (contemporary African tunes)
0505 R. New Zealand Int. Checkpoint (RNZ National Radio's flagship evening news program)
0510 R. Australia Pacific Beat (one of RA's primary programs, this daily current events and features magazine focuses in on the Pacific island nations)
0515 R. Japan 44 Minutes (current affairs magazine about Japan and Asia)
0530 Voice of Nigeria VON Scope (an in-depth roundup of the news in Nigeria, west Africa and the world)

Monday

0500 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)
R. Habana Cuba Weekly Review (Cuba's perspective on current events)
R. Netherlands Dutch Horizons (Bertine Krol chronicles life in Holland)
WWCR(3210kHz.) World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)
0505 Deutsche Welle Religion and Society (an insight into religious events around the world)
0515 Deutsche Welle Cool (Erica Gingerich and Anke Rasper present DW's youth magazine with reports on the attitudes, music and style of young Europe)
0530 BBCWS(am) Play of the Week (classic and contemporary drama for radio)
China R. Int. People in the Know (interviews with prominent Chinese who are shaping the nation's future)
R. Habana Cuba 40th Anniversary of RHC (special reports on the history of the station)
WWCR(3210kHz.) Communications World (Kim Elliott reviews the week in global communications)
0540 R. Habana Cuba The Mailbag Show (listener letters)
0545 R. Exterior de Espana Radio Club (a repeat of Saturday's program)
0550 R. Habana Cuba Breakthrough (Arnie Coro with a report on science)

Tuesday-Saturday

0500 R. Exterior de Espana REE's News Service (featuring international, Ibero-American and national news in-depth, a review of the Spanish press, commentaries and analyses)
0505 Deutsche Welle Newslink (daily current affairs magazine focused on Europe)
0545 R. Exterior de Espana Spanish Language Course

Tuesday

0500 R. Netherlands The Research File (a magazine emphasizing the relevance of science to all our lives)
0505 BBCWS(am) Omnibus (a weekly documentary feature program that tackles any topic across the globe)
0530 BBCWS(am) Composer of the Month (the life, career and music of a selected composer)
China R. Int. Sports World (the sports scene in China and Asia)
Deutsche Welle Insight (a look at major international trends and developments)

Wednesday

0500 HCJB Ecuador The Book and the Spade (the latest discoveries and developments in Biblical archaeology)
R. Netherlands Music 52/15 (Martha Hawley presents musical styles from around the globe.)
0505 BBCWS(am) Meridian-Masterpiece (critical examinations of creative endeavors)
0530 Deutsche Welle Man and Environment (John Hay presents the human element in environmental issues.)
0530 BBCWS(am) The Music Mix (insights into current popular music)[6th & 13th—Club Culture—Claire Smith takes an in-depth look at the world of popular dance music from backroom boys to the superstar DJs and producers.]
0540 R. Habana Cuba DXers Unlimited (Arnie Coro presents a program for radio enthusiasts.)

Shortwave Guide

Thursday
0500 R. Netherlands — The Weekly Documentary (RN's award-winning sound essays and in-depth investigations)
0505 BBCWS(am) — Meridian-Screen (interviews, documentaries, features and discussions on the film arts)
0530 Deutsche Welle — Living in Germany (people, places and events in Germany)

Friday
0500 HCJB Ecuador — Inspirational Classics (classical music selections inspired by religious and spiritual themes)
R. Netherlands — The Basement Sessions (RN's jazz expert Hans Mantel presents the best classic jazz recordings from the RN archives.)
0505 BBCWS(am) — Music Review (classical music news and features)
0530 China R. Int. — Life in China (a weekly magazine focusing on the lives of ordinary people in China)
Deutsche Welle — Hard to Beat: The World of Sport (weekly report on German and European sport)
R. New Zealand Int. — The Pacific Report (a report on trends and events in the Pacific region)

Saturday
0500 R. Netherlands — A Good Life (how development affects societies)
Voice of Nigeria — African Safari (exploring the roots of African musical styles)
WHRI(5745kHz.) — Dxing with Cumbre (Marie Lamb with the hottest DX catches)
0505 BBCWS(am) — Meridian-Writing (reports on books, theatre, poetry, journalism, biography, history and anthopology)
R. Australia — Pacific Focus-Sport (the week's sports news as reported on the daily magazine 'Pacific Beat')
R. New Zealand Int. — Tagata o te Moana (Anita Purcell presents a weekly Pacific magazine with NZ and regional Pacific news, issues, information and music)
0510 R. Japan — Hello from Tokyo (listener letters, music and short features)
0530 BBCWS(am) — Charlie Gillett (presents his selection of music from around the globe)
Deutsche Welle — German by Radio (a language lesson)
R. Australia — Lingua Franca (Jill Kitson presents a program about language and its social, cultural and historical ramifications.)
0535 R. Exterior de Espana — Radio Club (answering listeners' letters)
0545 R. Exterior de Espana — Radio Waves (a weekly program for radio enthusiasts)

0600 UTC - Page 46 Freqs

Sunday
0600 BBCWS(am) — World Briefing (a 20 minute round-up of the world's news)
0605 R. Australia — The Europeans (historical and cultural perspectives on European societies.)
R. New Zealand Int. — Storytime (readings for children)
0610 R. Japan — Weekend Square (A program designed to present various aspects of Japan in a friendly and relaxed atmosphere with interviews, music and discussions.)
0620 BBCWS(am) — Sports Roundup (all the daily sporting news worldwide)
0630 BBCWS(am) — Agenda (the ideas and trends shaping our world)
WHRI(5745kHz.) — DXing with Cumbre (Marie Lamb with the latest DX catches)
0635 R. Habana Cuba — The World of Stamps (This just might be the only program on radio on philatelic matters.)
0645 R. Habana Cuba — 40th Anniversary of RHC (special reports on the history of the station)

Monday-Friday
0615 R. Japan — Asian Top News (the day's major stories as reported by the region's radio stations)
0630 BBCWS(am) — World Business Report (a guide through the main business issues of the day)

Monday
0600 BBCWS(am) — Play of the Week (continues from 0530.)
R. Habana Cuba — From Havana (a showcase of contemporary Cuban music and musicians)
Voice of Nigeria — This Week on VoN (a preview of some the coming week's programs to be broadcast on Voice of Nigeria)
0625 R. Japan — Unforgettable Musical Masterpieces (a focus on Japanese pop songs written in the post war years as a means of explaining Japanese history and attitudes)
0630 R. Habana Cuba — The Jazz Place (the very best of Cuban jazz)
0640 R. Australia — The Australian Music Show (the latest rock music from the Triple J youth network of the ABC)

Tuesday-Saturday
0600 BBCWS(am) — World Briefing (a 20 minute round-up of the world's news)
0620 BBCWS(am) — Sports Roundup (all the daily sporting news worldwide)

Tuesday
0625 R. Japan — Let's Learn Japanese (a Japanese language lesson for beginners)
0640 R. Australia — Music Deli (Australian performances of folk, acoustic, traditional and world music)

Wednesday
0625 R. Japan — Japan Music Log
0640 R. Australia — Blacktracker (Mal Honess presents contemporary Aboriginal music)

Thursday
0625 R. Japan — Brush Up Your Japanese (an intermediate course in Japanese)
0640 R. Australia — Oz Country Style (country music from Australia)

Friday
0605 R. New Zealand Int. — Focus on Politics (a report on government and politics in NZ)
0625 R. Japan — Music Beat (contemporary Japanese popular music)
0640 R. Australia — Music Deli (Australian performances of folk, acoustic, traditional and world music)

Saturday
0610 R. Japan — Pop! Goes Asia (a look at Asia as it is now, presenting the cultures and lifestyles of other Asian countries through their popular music)
0630 BBCWS(am) — People and Politics (the week in Parliament)
R. Australia — Arts Talk (Julie Copeland presents the world of arts and cultural ideas)
R. New Zealand Int. — In a Mellow Tone (Hayden Shirley plays relaxing and nostalgic music)

1100 UTC - Page 48 Freqs

Daily
1100 BBCWS(am) — World Briefing (a daily 20 minute report on the latest news)
R. Australia — RA News
R. Japan — News
R. New Zealand Int. — RNZ News
1120 BBCWS(am) — News About Britain
1130 R. Korea Int. — News

Sunday
1105 R. Australia — Correspondents' Report (The ABC's overseas reporters give their interpretation and analysis of the week's major events.)
R. New Zealand Int. — Sportsworld (a weekly sports magazine produced by commercial NZ network Radio Sport)
1110 R. Japan — Hello from Tokyo (listener letters, music and short features)
1130 BBCWS(am) — Arts in Action (a weekly report on trends and developments in the fine arts around the world)
1130 R. Sweden — In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström)
Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first.)
1140 R. Korea Int. — Multiwave Feedback (RKI's interactive program for DXers and SWLs)

Monday-Friday
1105 BBCWS(am) — Caribbean Report (the latest news in the Caribbean)[on 6195 and 15220 kHz. only]
R. Australia — Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
1110 BBCWS(am) — Caribbean Sport [on 6195 and 15220 kHz. only]
1115 BBCWS(am) — Caribbean Magazine (a current affairs and feature program focusing on life in the region)[on 6195 and 15220 kHz. only]
R. Japan — Asian Top News (the day's major stories as reported by the region's radio stations)
1130 BBCWS(am) — World Business Report (a guide through the main business issues of the day)
HCJB Ecuador — Morning in the Mountains (the longstanding breakfast program from The Voice of the Andes with news, sports, prayer, friendly conversation and inspirational music)
R. Australia — RA Sport (a daily report on sports events in Australia, Asia and the world)
1130 R. Sweden — Sixty Degrees North (reports, interviews and analysis on the Nordic region)

Monday
1105 R. New Zealand Int. — Kim Hill (interviews on topical issues and events)
1125 R. Japan — Unforgettable Musical Masterpieces (a focus on Japanese pop songs written in the post war years as a means of explaining Japanese history and attitudes)
1145 BBCWS(am) — Sports Round-up (all the daily sporting news worldwide)
R. Sweden — Sports Scan (a weekly report on sports in the Nordic region)

Tuesday
1100 WWCR(15685kHz) — World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)
1105 R. New Zealand Int. — Kim Hill (interviews on topical issues and events)
1125 R. Japan — Let's Learn Japanese (a Japanese language lesson for beginners)
1145 R. Korea Int. — Cultural Promenade (reports on contemporary and traditional Korean arts and culture)
1145 BBCWS(am) — Sports Round-up (all the daily sporting news worldwide)
R. Sweden — Media Scan (the oldest program of its kind, George Wood now concentrates on satellite and cyberspace communications every first and third week)

Wednesday
1100 WWCR(15685kHz) — Communications World (Kim Elliott reviews the week in global communications.)
1105 R. New Zealand Int. — Kim Hill (interviews on topical issues and events)
1125 R. Japan — Japan Music Log
1145 BBCWS(am) — Sports Round-up (all the daily sporting news worldwide)
R. Korea Int. — Economic Radar (reports on Korean businesses and the Korean and Asian economies)
1145 R. Sweden — Money Matters (a weekly economic report on the Nordic region)

Thursday
1105 R. New Zealand Int. — Kim Hill (interviews on topical issues and events)
1125 R. Japan — Brush Up Your Japanese (an intermediate course in Japanese)
1145 R. Korea Int. — Korea and Its Splendors (a visit to a major historical, cultural or tourist attraction in Korea)
1145 BBCWS(am) — Sports Round-up (all the daily sporting news worldwide)
R. Sweden — Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)
Greenscan (Azariah Kiros highlights Swedish environmental awareness and challenges the second week of the month.)
Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month.)
The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month.)

Friday
1105 R. New Zealand Int. — Sports Story (a sport profile or documentary)
1125 R. Japan — Music Beat (contemporary Japanese popular music)
1130 R. New Zealand Int. — RNZI Top Five (the best-selling music in NZ)
1145 R. Korea Int. — Notes of Nostalgia (traditional Korean music)
1145 BBCWS(am) — Football Extra (global soccer news, reviews and interviews)
R. Sweden — A Report on the Nordic Newsweek (the week's main news stories)

Saturday
1110 R. Japan — Pop! Goes Asia (a look at Asia as it is now, presenting the cultures and lifestyles of other Asian countries through their popular music)
1105 R. Australia — Asia Pacific Weekend Edition (weekly current events and business report for and about Asia and the Pacific region)
R. New Zealand Int. — The World in Sport (Dmitri Edwards presents highlights of the world's sporting week with emphasis on NZ and the Pacific.)
1130 BBCWS(am) — World Business Review (Martin Webber explains the consequences of recent business developments for companies, investors and consumers)
1130 R. Sweden — Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)
Sweden Today (George Wood presents the voices of Sweden, the second week of the month)
Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)
Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)
1130 WHRI(9495 kHz.) — Dxing with Cumbre (Marie Lamb with the hottest DX catches)
1130 WWCR(15685kHz.) — World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)
1135 R. New Zealand Int. — Dateline Pacific (the major Pacific stories of the week, with background and reaction from the people making the news,presented by Don Wiseman)
1140 R. Korea Int. — From Us to You (RKI answers listener mail and rewards its contest winners)
1145 BBCWS(am) — Sports Round-up (all the daily sporting news worldwide)

1200 UTC - Page 49 Freqs

Daily
1200 BBCWS(am) — Newshour (an hour of news and analysis from around the globe)

R. Australia RA News
R. New Zealand Int. RNZ News

Sunday

1205 R. Australia Country Club (Richard Porteous with an off-the-road ramble through the various tracks that make up that very wide field of country music)
1205 R. New Zealand Int. Sunday Supplement (listening to the opinions and attitudes of New Zealanders)
1225 R. New Zealand Int. A Question of Religion (Maureen Garing talks with different guests about religion and its aspects in the widest sense, as well as answers listeners' questions.)
1230 R. Sweden In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström)
Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first.)
1230 YLE R. Finland Capital Cafe (conversations with Finns from all walks of life)

Monday-Friday

1200 HCJB Ecuador Latin American and International News
1205 BBCWS(am) Caribbean Business (a report on regional commerce and economics)[on 6195 and 15220 kHz. only]
HCJB Ecuador Sports Report
R. New Zealand Int. Late Edition (National Radio's major late evening newscast)
1210 BBCWS(am) Caribbean Report (the latest news in the Caribbean)[on 6195 and 15220 kHz. only]
HCJB Ecuador Morning in the Mountains (continues from 1130)
1210 R. Canada Int. This Morning (Shelagh Rogers hosts a lively mix of interviews, documentaries, music, and personal essays debating and discussing issues important to Canadians and showcasing Canada's finest writers, musicians, and artists.)
1230 HCJB Ecuador Latin American and International News
R. Sweden Sixty Degrees North (reports, interviews and analysis on the Nordic region)
1230 YLE R. Finland Finland This Morning (a breakfast program with news, a business report, sports, weather and interviews focused on Finland and the Nordic region)
1235 HCJB Ecuador Morning in the Mountains (continues from 1130)

Monday

1205 R. Australia Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)
1245 R. Sweden Sports Scan (a weekly report on sports in the Nordic region)

Tuesday

1205 R. Australia Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)
1245 R. Sweden Media Scan (the oldest program of its kind, George Wood now concentrates on satellite and cyberspace communications every first and third week)

Wednesday

1205 R. Australia Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)
1245 R. Sweden Money Matters (a weekly economic report on the Nordic region)

Thursday

1205 R. Australia Late Night Live (Philip Adams interviews the major newsmakers, philosophers, artists and trendsetters in Australia and around the world)
1245 R. Sweden Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)
Greenscan (Azariah Kiros highlights Swedish environmental awareness and challenges the second week of the month)
Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)
The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)

Friday

1205 R. Australia Sound Quality (Tim Ritchie seeks out the interesting, the evolutionary, the inaccessible and the wonderful in music)
1245 R. Sweden A Report on the Nordic Newsweek (the week's main news stories)

Saturday

1200 WHRI(6040kHz.) Dxing with Cumbre (Marie Lamb with the hottest DX catches)
1205 R. Australia The Spirit of Things (Dr. Rachael Kohn explores contemporary values and beliefs as expressed through ritual, art, music, and sacred texts)
1205 R. New Zealand Int. Deep Purple (relaxing and thoughtful music with a touch of nostalgia)
1230 R. Sweden Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)
Sweden Today (George Wood presents the voices of Sweden, the second week of the month)
Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)
Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)
1230 WHRI(9495kHz.) Dxing with Cumbre (Marie Lamb with the hottest DX catches)
1230 YLE R. Finland Finland This Week (the best reports and interviews from the weekday program, Finland This Morning)
1245 YLE R. Finland Starting Finnish (a language lesson)

1300 UTC Page 49 Freqs

Daily

1300 BBCWS(am) News
China R. Int. News
R. Canada Int. CBC News

Sunday

1300 Channel Africa Channel Africa Extra (a weekend magazine and variety show with news, sports, music, regular reports and features)
1305 BBCWS(am) Music Live Concerts (The BBC kicks off its Music Live 2001 series with eight weekly live jazz performances from around Britain.)
R. Australia Country Club (continues from 1205)
1310 R. Canada Int. The Sunday Edition (the more relaxed and reflective weekend edition of This Morning, hosted by Michael Enright)
1320 China R. Int. In the Spotlight (Chinese arts and cultural magazine)
1330 BBCWS(am) In Praise of God (diverse services of worship)
R. Sweden In Touch with Stockholm (an interactive listener contact program presented the first weekend of each month by Nidia Hagström)
Sounds Nordic (R. Sweden's youth music and trends magazine, presented by Gaby Katz every weekend of the month but the first.)

Monday-Friday

1300 R. Australia RA News (a fifteen minute report with emphasis on significant events in Asia and the Pacific region)
1305 BBCWS(am) Outlook (topical magazine of people, places and events)[In the week leading up to the June 8 election, Iran in Focus examines Iranian life and culture with features exploring such diverse topics as rice, marriage, the Gabbeh carpet, a day in the life of a Mullah, and Iran's traffic police.]
1305 R. Canada Int. This Morning (continues from 1210)
1315 R. Australia The Planet (Lucky Oceans, a/k/a Reuben Gosfield, presents good, heartfelt, inspiring music from around the world with a rich mix of jazz, blues, folk styles, art music and more in a show artfully arranged for radio.)
1330 R. Sweden Sixty Degrees North (reports, interviews and analysis on the Nordic region)
1345 BBCWS(am) Off the Shelf (abridged serialized readings of novels, stories and other literature)

Monday

1330 China R. Int. People in the Know (interviews with prominent Chinese who are shaping the nation's future)
1345 R. Sweden Sports Scan (a weekly report on sports in the Nordic region)

Tuesday

1330 China R. Int. Sports World (the sports scene in China and Asia)
1345 R. Sweden Media Scan (the oldest program of its kind, George Wood now concentrates on satellite and cyberspace communications every first and third week)

Wednesday

1345 R. Sweden Money Matters (a weekly economic report on the Nordic region)

Thursday

1345 R. Sweden Nordic Report (a monthly magazine on Scandinavia produced by the broadcasters of the Nordic region and broadcast the first week of the month)
Greenscan (Azariah Kiros highlights Swedish environmental awareness and challenges the second week of the month)
Heart Beat (Gaby Katz hosts a monthly health and medical magazine, the third week of the month)
The S-Files (Kris Boswell takes you to the Sweden behind the headlines, the fourth week of the month)

Friday

1330 China R. Int. Life in China (a weekly magazine focusing on the lives of ordinary people in China)
1345 R. Sweden A Report on the Nordic Newsweek (the week's main news stories)

Saturday

1300 Channel Africa Channel Africa Extra (a weekend magazine and variety show with news, sports, music, regular reports and features)
1305 BBCWS(am) Global Business (Peter Day charts the transformations sweeping through the world of work and commerce)
R. Australia The Science Show (one of the longest running programs on ABC Radio)
1310 R. Canada Int. The House (Jason Moscovitz presents a review of the week in Canadian national politics)
1330 BBCWS(am) People and Politics (inside British politics)
R. Sweden Weekend (a magazine about Europe from the Radio E consortium, on the first week of the month)
Sweden Today (George Wood presents the voices of Sweden, the second week of the month)
Spectrum (Bill Schiller covers the Swedish cultural scene, the third week of the month)
Studio 49 (conversations on ideas and long-term trends in Sweden and the Nordic region, the fourth week of the month)

1400 UTC - Page 50 Freqs

Daily

1400 BBCWS(am) News
China R. Int. News
R. Australia RA News
R. Canada Int. CBC News
R. Japan News

Sunday

1400 Channel Africa Channel Africa Extra (continued from 1300)
1405 BBCWS(am) Talking Point (where listeners and internet users can share their views on the issues of the day and put questions to expert guests)
R. Australia Books and Writing (Ramona Koval conducts in-depth discussions focusing on books, ideas and writing)
R. Canada Int. The Sunday Edition (continues from 1310, usually with a feature documentary)
1410 R. Japan Roundup Asia (interviews and reports highlighting various aspects of the rapidly changing Asian region)
1420 China R. Int. In the Spotlight (Chinese arts and cultural magazine)
1430 WHRI(6040 kHz.) Dxing with Cumbre (Marie Lamb with the hottest DX catches)

Monday-Friday

1405 R. Australia The Planet (continues from 1315)
1405 R. Canada Int. This Morning (continues from 1210)
1415 R. Japan 44 Minutes (current affairs magazine about Japan and Asia)

Monday

1405 BBCWS(am) Meridian-Masterpiece (critical examinations of creative endeavors)
1430 BBCWS(am) The Music Mix (insights into current popular music)[4th & 11th—Club Culture—Claire Smith takes an in-depth look at the world of popular dance music from backroom boys to the superstar DJs and producers.]
China R. Int. People in the Know (interviews with prominent Chinese who are shaping the nation's future)
1445 R. Canada Int. Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)

Tuesday

1405 BBCWS(am) Meridian-Screen [On Screen-a weekly report on international cinema]
1430 China R. Int. Sports World (the sports scene in China and Asia)
1445 R. Canada Int. Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)

Wednesday

1405 BBCWS(am) Music Review (classical music news and features)
1430 BBCWS(am) Westway (a radio soap opera)
1445 R. Canada Int. Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)

Thursday

1405 BBCWS(am) Meridian-Writing (reports on books, theatre, poetry, journalism, biography, history and anthopology)
1430 BBCWS(am) Charlie Gillett (presents his selection of music from around the globe)
1445 R. Canada Int. Out Front (a place for new ideas, new ways of making radio and new voices from across Canada)

Shortwave Guide

Friday
1405 BBCWS(am) Omnibus (a weekly feature documentary program that tackles any topic across the globe)
1430 BBCWS(am) Westway (a radio soap opera)
China R. Int. Life in China (a weekly magazine focusing on the lives of ordinary people in China)
1430 R. Canada Int. C'est La Vie (Bernard St.-Laurent presents a program about life in Quebec and French-speaking Canada.)
1445 BBCWS(am) Revolver (A guest musical artist gives a personal view on a selection of the best new releases from country to techno.)

Saturday
1400 Channel Africa Channel Africa Extra (continued from 1300)
1405 BBCWS(am) Sportsworld (live commentary on major sports events and fixtures, reports and results from around Britain and Europe, and news of all the day's sporting action from around the world)
R. Australia New Dimensions (intimate conversations with many of this century's leading thinkers and social innovators)
R. Canada Int. Basic Black (Journalist, author, and humorist Arthur Black features people with unusual occupations, bizarre passions, and arcane obsessions, capped off with a quirky squint at the week's events in a closing monologue)
1410 R. Japan Weekend Square (a program designed to present various aspects of Japan in a friendly and relaxed atmosphere with interviews, music and discussions)

1500 UTC - Page 50 Freqs

Daily
1500 BBCWS(am) News
R. Australia RA News
1530 R. Austria Int. Report from Austria (a daily magazine focusing on Austria and central and eastern Europe)

Sunday
1500 R. Canada Int. CBC News
1500 WHRI(15105 kHz.) Dxing with Cumbre (Marie Lamb with the hottest DX catches)
1505 BBCWS(am) Concert Hall (classical music recitals and performances)
R. Australia Encounter (a highly acclaimed series exploring the connections between religion and life while reflecting on the religious experience of multicultural Australia)
R. Canada Int. The Sunday Edition (continues from 1310)
1535 R. Austria Int. Radio E (A weekly magazine on Europe jointly produced by the BBC and other European broadcasters.)

Monday-Friday
1505 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)

Monday
1505 BBCWS(am) One Planet (stories about the environment, development, agriculture and human impact on the natural world)[Parts 2 and 3 of three special editions of this program, focusing on how Britain's changing environmental policy is affecting individuals and communities, will air during the first two weeks of the month.]
1530 BBCWS(am) People and Places (a forum for the exchange of views and experiences on a global scale)[This month, the last four programs in the ten-part series, True Lives, which invites listeners to identify the issues you think are the most important affecting lives in the 21st century. E-mail <jenny.waters@bbc.co.uk> or write Room 607SE, Bush House, London.]
R. Australia The Health Report (Dr. Norman Swan's weekly report on health and medical issues)

Tuesday
1505 BBCWS(am) Discovery (in-depth exploration of ideas and discoveries in science and technology)
1530 BBCWS(am) Essential Guide (the biggest developments, issues and names in global affairs)[This month, the last three parts of the four program series, Block on Block, in which Richard Fenby explores the ingenuity of the builders of great structures, past and present, by investigating tunnels, towers and bridges.]
R. Australia The Law Report (Damien Carrick presents breaking legal stories in Australia and overseas.)

Wednesday
1505 BBCWS(am) Health Matters (reports on research explaining where medicine is going)
1530 R. Australia The Religion Report (John Cleary examines the way religion and societies interact)
1530 BBCWS(am) Everywoman (the BBC's international magazine for women)

Thursday
1505 BBCWS(am) Science View (the latest research put in a wider social context)
1530 BBCWS(am) Focus on Faith (Trevor Barnes looks at the religious stories behind the news)
R. Australia The Media Report (Mick O'Regan takes a critical look at the latest developments in the communications industry)

Friday
1505 BBCWS(am) Sports International (the issues and personalities behind the headlines)
1530 BBCWS(am) Pick of the World (Daire Brehan presents World Service highlights and talks with the producers and presenters of BBC programs)
China R. Int. Life in China (a weekly magazine focusing on the lives of ordinary people in China)
R. Australia The Sports Factor (Amanda Smith presents reports which debate and celebrate the cultural significance of sport.)

Saturday
1505 BBCWS(am) Sportsworld (continues from 1405)
R. Australia Melisma (Robyn Johnston weaves together chamber music, folk sources and jazz innovations in a graceful, melodic and sometimes challenging two hours)
R. Canada Int. Basic Black (continues from 1405)
1530 R. Canada Int. The Muckraker (Canadian political satire)

1600 UTC - Page 51 Freqs

Daily
1600 R. Australia RA News

Sunday
1600 BBCWS(am) News Summary
1605 BBCWS(am) Sunday Sportsworld (live commentary on major sports events and fixtures, reports and results from around Britain and Europe, and news of all the day's sporting action from around the world)
R. Australia The National Interest (Terry Lane's round-up of the week's major issues)

Monday-Friday
1600 BBCWS(am) Europe Today (news, analysis and comment on issues and events on the continent)
1630 BBCWS(am) World Business Report
1645 BBCWS(am) Sports Roundup (all the daily sporting news worldwide)

Tuesday
1605 R. Australia The Comfort Zone (Alan Saunders presents a unique program that debates and celebrates the cultural significance of architecture and design, landscape and gardens, and food)

Wednesday
1605 R. Australia Verbatim (a program that charts the story of the 20th century through the voices of ordinary Australians)
1630 R. Australia Earshot (a half-hour feature from the footpaths, paddocks, lounge rooms and shopping malls of the diverse Australian continent)

Thursday
1605 R. Australia Hindsight (a documentary program that looks at Australian social history through the broad themes of institutions, popular culture, health and the environment)

Friday
1605 R. Australia Awaye! (Produced and presented by Aboriginal broadcasters, this is Australia's only national indigenous arts and culture program)

Saturday
1600 BBCWS(am) News
1605 BBCWS(am) Sportsworld (continues from 1405)
R. Australia Melisma (continues from 1505)

2300 UTC - Page 55 Freqs

Daily
2300 BBCWS(am) News
China R. Int. News
R. Australia RA News

Sunday
2300 BBCWS(am) The World Today (the BBC's agenda-setting flagship global news program)
WBCQ(7415kHz.) Le Show (Harry Shearer's tour-de-force variety show.)
WBCQ(9335kHz.) Veterans Information Radio (a program for veterans by veterans)
2305 R. Canada Int. Global Village (Jowi Taylor fields reports and music from global venues)
2310 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
2320 China R. Int. In the Spotlight (Chinese arts and cultural magazine)
2330 BBCWS(am) The Greenfield Collection (Edward Greenfield plays classical music requests and selections drawn from his own collection)
R. Australia Earthbeat (Alexandra DeBlas presents a program on environmental science)
2330 R. Netherlands News
2330 WHRI(5745kHz.) Dxing with Cumbre (Marie Lamb with the hottest DX catches)
2335 R. Netherlands Sincerely Yours (Howard Shannon and Neville Powis host RN's listener response program.)

Monday-Friday
2305 BBCWS(am) Outlook (topical magazine of people, places and events)[In the week leading up to the June 8 election, Iran in Focus examines Iranian life and culture with features exploring such diverse topics as rice, marriage, the Gabbeh carpet, a day in the life of a Mullah, and Iran's traffic police.]
2305 R. Canada Int. As It Happens (Barbara Budd and Mary Lou Finley interview newsmakers from the famous to ordinary people eyewitnessing news in the making.) [Program begins at 2230.]
2330 R. Netherlands Newsline (news, analysis and background reports)

Monday
2310 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
2330 China R. Int. People in the Know (interviews with prominent Chinese who are shaping the nation's future)
R. Australia Innovations (a program showcasing Australian invention, enterprise and ingenuity)
2345 BBCWS(am) Patterns of Faith (a global exploration of religious values and human wisdom)

Tuesday
2310 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
2330 China R. Int. Sports World (the sports scene in China and Asia)
R. Australia Arts Talk (Julie Copeland presents the world of arts and cultural ideas)
2345 BBCWS(am) Language Steamrollers (Sarah Griffith traces how thousands of languages have been "steamrollered" out of existence by the handful of language groups that dominate the world today.)

Wednesday
2310 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
2330 R. Australia Rural Reporter (ABC's rural reporters present news and stories from rural and regional Australia)
2330 WBCQ(7415kHz.) World of Radio (Glenn Hauser's comprehensive review of the week in shortwave and international broadcasting)
2345 BBCWS(am) Heart and Soul (global religious and spiritual experiences)

Thursday
2310 R. Australia Asia-Pacific (Radio Australia's flagship current events and business report for and about Asia and the Pacific region)
2330 R. Australia The Media Report (Mick O'Regan takes a critical look at the latest developments in the communications industry)

Friday
2305 R. Australia Lingua Franca (Jill Kitson presents a program about language and its social, cultural and historical ramifications.)
2330 China R. Int. Life in China (a weekly magazine focusing on the lives of ordinary people in China)
R. Australia The Sports Factor (Amanda Smith presents reports which debate and celebrate the cultural significance of sport.)
2345 BBCWS(am) Green Champions (Martin Wainwright explores the amazing world of plants and looks at the contributions they make to our welfare.)

Saturday
2301 BBCWSam Play of the Week (classic and contemporary drama for radio)
2305 R. Australia Ockham's Razor (sharp comnmentaries on scientific issues)
2305 R. Canada Int. Quirks and Quarks (what's new and next in science)
2330 R. Netherlands News
2335 R. Netherlands Europe Unzipped (the events of the past week in Europe, some unusual)

Satellite Service Guide

All Frequencies MHz

Robert Smathers
roberts@nmia.com
www.grove-ent.com/mtssg.html

Loral Orion Telstar 5 - C-Band

97 degrees West longitude

1(V) 3720 Buena Vista Syndication
2(H) 3740 Data Transmissions
3(V) 3760 (none)
4(H) 3780 Nebraska Educational TV (digital)
5(V) 3800 Occasional video
6(H) 3820 Occasional video
7(V) 3840 Occasional video
8(H) 3860 ABC Newsone
9(V) 3880 FOX feeds
10(H) 3900 FOX feeds
11(V) 3920 Data Transmissions/LDS TV (digital)
12(H) 3940 Occasional video
13(V) 3960 FOX - East (LEITCH)
14(H) 3980 Occasional video
15(V) 4000 UPN Network/Paramount feeds/ Globecast (digital)
16(H) 4020 Paramount feeds
17(V) 4040 Data Transmissions
18(H) 4060 AFRTS (digital)
19(V) 4080 America's Collectibles Network
20(H) 4100 Occasional video
21(V) 4120 ABC - West (LEITCH)
22(H) 4140 ABC - East (LEITCH)
23(V) 4160 Occasional video
24(H) 4180 Occasional video/N.C. Open Net (occasional)

Loral Orion Telstar 5 - Ku-Band

97 degrees West longitude

1(V) 11728.5 Data Transmissions
2(H) 11735.0 Data Transmissions/Bob Jones University (digital)
3(V) 11789.5 Occasional video
4(H) 11796.0 Data Transmissions
5(V) 11836.0 Occasional video
6(H) 11842.5 Data Transmissions
7(V) 11867.0 Data Transmissions
8(H) 11873.5 Various International television (digital)
9(V) 11898.0 Various International television (digital)
10(H) 11904.5 Data Transmissions
11(V) 11929.0 Occasional video
12(H) 11935.5 Occasional video
13(V) 11960.0 Occasional video
14(H) 11966.5 Data Transmissions
15(V) 11991.0 Data Transmissions
16(H) 11997.5 Data Transmissions
17(V) 12022.0 Data Transmissions
18(H) 12028.5 Data Transmissions
19(V) 12053.0 Occasional video
20(H) 12059.5 Data Transmissions
21(V) 12084.0 Various International television (digital)
22(H) 12090.5 ABS-CBN International (digital)
23(V) 12115.0 Various International television (digital)
24(H) 12121.5 (none)
25(V) 12146.0 Occasional video
26(H) 12152.5 Globecast World Satellite TV (digital)
27(V) 12177.0 Maharishi Open University/Thai TV 5 (digital)
28(H) 12183.5 Spacecom Systems Data Services/FM2 Services
Data Transmissions .06, .15, .23, .30, .35, .38 .47, .65, .89, .93, .96, 1.05, 1.12, 1.22, 1.35 MHz

Panamsat Galaxy 4R - C-Band

99 degrees West longitude

1(H) 3720 Digital audio services
2(V) 3740 Galaxy 3D (digital)
3(H) 3760 **SCPC Radio Services**
1404.40 55.60 WMVP-AM 1000, Chicago, IL - talk radio/White Sox MLB radio network
1403.10 56.90 WXYT-AM Detroit, MI - Tigers MLB radio network
1402.90 57.10 Agrinet/USA Radio Network
1402.00 58.00 Occasional Audio
1401.50 58.50 Occasional Audio
1399.00 61.00 Sports Byline USA/Sports Byline Weekend
1397.50 62.50 Minnesota Talking Book net
1397.30 62.70 Accent Radio Network
1397.10 62.90 Wisconsin Radio Network
1396.70 63.30 Radio America / Business News Network
1395.80 64.20 WTMJ-AM, Milwaukee, WI - news/talk/Brewers MLB radio network
1395.00 65.00 Occasional Audio
1394.70 65.30 WJR-AM, Detroit, MI - talk radio/Michigan News Network
1383.10 76.90 KIRO-AM Seattle, WA - news/talk/Mariners MLB radio network
1382.90 77.10 Michigan News Network
1382.60 77.40 Soldiers Radio Network
1382.30 77.70 Motor Racing Network (occ)
1382.00 78.00 Occasional Audio
1381.60 78.40 Occasional Audio
1381.40 78.60 Occasional Audio
1381.20 78.80 Occasional Audio
1380.90 79.10 Occasional Audio
1377.10 82.90 In-Touch reading service
1376.00 84.00 Kansas Audio Reader Network
4(V) 3780 WB Network (digital)
5(H) 3800 (none)
6(V) 3820 WB Domestic TV Distribution (digital)
7(H) 3840 (none)
8(V) 3860 (none)
9(H) 3880 Mexican services (digital)
10(V) 3900 (none)
11(H) 3920 Mexican services (digital)
12(V) 3940 Occasional video
13(H) 3960 (none)
14(V) 3980 Occasional video services (digital)
15(H) 4000 World Harvest TV
6.48, 7.30 WPHZ-FM, Bremen, IN - Contemporary Music
7.47 World Harvest shortwave feeder
7.55 World Harvest shortwave feeder
7.64 World Harvest shortwave feeder
7.73 World Harvest shortwave feeder
7.82 World Harvest shortwave feeder
16(V) 4020 Shepherd's Chapel Network - Pastor Murray
7.32 KNEA-AM 970, Jonesboro, AR - sports
17(H) 4040 (none)
18(V) 4060 CCTV China (digital)
19(H) 4080 Occasional video
20(V) 4100 Occasional video
21(H) 4120 Occasional video
22(V) 4140 Occasional video
23(H) 4160 (none)
24(V) 4180 Occasional video

Panamsat Galaxy 4R - Ku-Band

99 degrees West longitude

1(H) 11720 (none)
2(V) 11740 (none)
3(H) 11760 (none)
4(V) 11780 Headend in the Sky (HITS) (digital)
5(H) 11800 Headend in the Sky (HITS) (digital)
6(V) 11820 Headend in the Sky (HITS) (digital)
7(H) 11840 Headend in the Sky (HITS) (digital)
8(V) 11860 (none)
9(H) 11880 Headend in the Sky (HITS) (digital)
10(V) 11900 Headend in the Sky (HITS) (digital)
11(H) 11920 Headend in the Sky (HITS) (digital)
12(V) 11940 Headend in the Sky (HITS) (digital)
13(H) 11960 Data Transmissions
14(V) 11980 (none)
15(H) 12000 (none)
16(V) 12020 (none)
17(H) 12040 Headend in the Sky (HITS) (digital)
18(V) 12060 Headend in the Sky (HITS) (digital)
19(H) 12080 (none)
20(V) 12100 (none)
21(H) 12120 (none)
22(V) 12140 Headend in the Sky (HITS) (digital)
23(H) 12160 Headend in the Sky (HITS) (digital)
24(V) 12180 Data Transmissions

GE Americom GE-4 - C-Band

101 degrees West longitude

1(V) 3720 Data Transmissions
2(H) 3740 Data Transmissions
3(V) 3760 Data Transmissions
4(H) 3780 Data Transmissions
5(V) 3800 (none)
6(H) 3820 (none)
7(V) 3840 Data Transmissions
8(H) 3860 (none)
9(V) 3880 Golden Eagle Broadcasting
5.80 KMUS-AM 1380, Muskogee, OK - religious
10(H) 3900 (none)
11(V) 3920 (none)
12(H) 3940 Hollywood Treasures Network
13(V) 3960 Data Transmissions
14(H) 3980 NPS Fox Sports Net (digital)
15(V) 4000 Data Transmissions
16(H) 4020 NPS Fox Sports Net (digital
17(V) 4040 (none)
18(H) 4060 WNBC-TV, NBC New York (Primetime 24) (VC2+)
19(V) 4080 Cornerstone Television
5.80 American Freedom Radio Network
20(H) 4100 (none)
21(V) 4120 Data Transmissions
22(H) 4140 WKRN-TV, ABC Nashville (Primetime 24) (VC2+)
23(V) 4160 Data Transmissions
24(H) 4180 WSEE-TV, CBS Erie, PA (Primetime 24) (VC2+)

GE Americom GE-4 - Ku-Band

101 degrees West longitude

Note: Transponders 25-28 are beamed to South America.

1(V) 11720 Data Transmissions
2(H) 11740 Data Transmissions
3(V) 11760 Data Transmissions
4(H) 11780 Data Transmissions
5(V) 11800 Data Transmissions
6(H) 11820 3 Angels Broadcasting Network (digital)
7(V) 11840 Data Transmissions
8(H) 11860 TVB Jade Channel (digital)
9(V) 11880 Data Transmissions
10(H) 11900 Data Transmissions
11(V) 11920 Data Transmissions
12(H) 11940 Data Transmissions
13(V) 11960 Data Transmissions
14(H) 11980 Data Transmissions
15(V) 12000 Data Transmissions
16(H) 12020 Data Transmissions
17(V) 12040 Data Transmissions
18(H) 12060 Data Transmissions
19(V) 12080 GE-4 ID Slate
20(H) 12100 Data Transmissions
21(V) 12120 Data Transmissions
22(H) 12140 Data Transmissions
23(V) 12160 Data Transmissions
24(H) 12180 Data Transmissions
25(V) 11535
26(H) 11535
27(V) 11655
28(H) 11655

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New Beginnings

How good it was to see NOAA-15 return to full operations at 1611 UTC March 15, with the APT transmission providing good quality imagery. The AVHRR scanner had been producing excellent quality HRPT (high resolution images) for several days, following a minor change in operations.

Problems causing loss of synchronization of HRPT (and therefore APT) data were traced by NOAA to thermal irregularities. By a careful reorientation of the solar panels, the thermal problems have apparently been reduced, and NOAA's daily resynchronization of the NOAA-15 AVHRR began on 20 March 2001. The resynchronization takes place at 0730 UTC each day and causes a brief disruption of all HRPT data, amounting to a few seconds.

Testing of this process by NOAA determined that a daily resynchronization will allow more usable AVHRR data on the HRPT and APT transmissions. Following commencement of this operation, each pass that I saw was perfectly synchronized.

❖ GOES Users' Conference

NOAA announced that a conference for the users of Geostationary Operational Environmental Satellites was to be held in Boulder, Colorado, U.S.A. from May 22 through 24, 2001. The goals of the conference include informing GOES users of plans for next generation capabilities; providing information on potential applications; determining user needs for new products, data distribution, and data archiving, and to assess potential user and societal benefits of GOES capabilities.

The Conference was organized by the National Oceanic and Atmospheric Administration (NOAA) with cooperation of the National Aeronautics and Space Administration (NASA), the American Meteorological Society (AMS), the National Weather Association (NWA), the National Institute of Standards and Technology (NIST), and the World Meteorological Organization (WMO). The format was to be two days of invited presentations followed by one day of breakout sessions with professional facilitators to assist the GOES user community in providing input to NESDIS. I hope to produce a summary of pertinent information in an edition of this column, following publication of the meeting report.

❖ All over the world

On any particular day there are always weather systems of some severity somewhere on the planet, and if you have set up a system for monitoring images from GOES (or Meteosat, in my case) you are likely to see a complete range. Remember that these satellites retransmit images originally received from other geostationary WXSATs. GOES-8 (the eastern GOES) transmits images produced by Meteosat-7 and GOES-10, as well as a scheduled selection of specific areas scanned by NOAA-14 or NOAA-16, and its native scans. Transmissions from GOES-10 (the west satellite) include a selection from Meteosat-7, GMS (the Japanese satellite) and GOES-8, as well as polar images.

Given a choice between the drama of severe weather in the form of hurricanes, or the quiet presence of a large anticyclone, I prefer the latter! Having experienced one hurricane and several vigorous storms during the last ten years, I cannot wish such weather on anyone! There is also the interest in seeing clear land.

I collected two images in quick succession this morning just to illustrate the diversity of weather. The first one originated from the Japanese GMS WXSAT and shows a near cloud-free Australia. They have been experiencing some extremes of weather during recent months, but in order to collect the visible-light images, I have to either leave the computer on overnight, or get up early in the morning before Australia's local sunset. I got up early for this one.

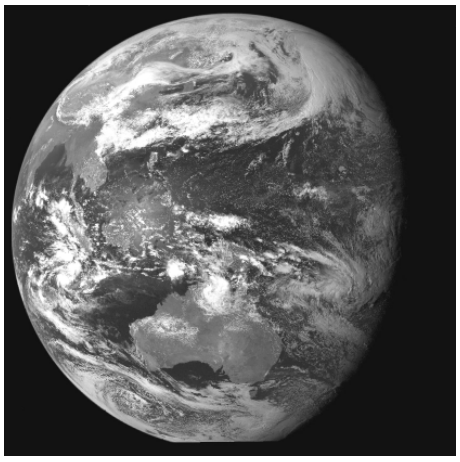

Fig 1: GMS April 5, 2001

Figure 2 was collected after I read the Daily Operational Significant Event Imagery Report #094 received on April 5, listing fires in Cuba and Florida, floods in Africa, a tropical system in the Indian ocean, and snow in the north-east US and Canada. Meteosat-5 is located over the Indian ocean and figure 2 clearly shows tropical cyclone 18S located to the east of Madagascar. The systems further east are also listed, and can be seen on figure 1 as well.

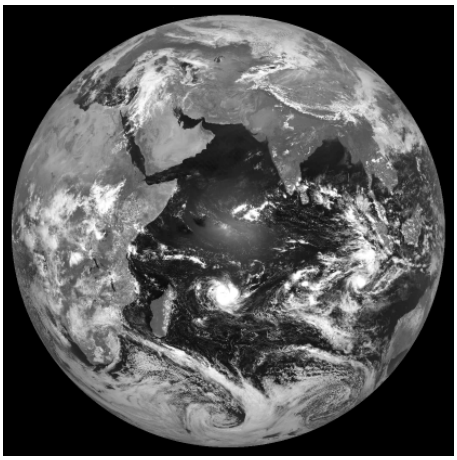

Fig 2: Meteosat-5 April 5, 2001

❖ Moving day

As I write this, Marion and I have just sold the house (subject to contract, as we say here), and are about to go house-hunting in Southampton, UK. The plan is to find a house with a good-sized garden for me to set up my telescope and satellite monitoring equipment. I have my priorities right!

Abbreviations

APT	Automatic Picture Transmission
AVHRR	Advanced Very High Resolution Radiometer
GOES	Geostationary Operational Environmental Satellites
HRPT	High Resolution Picture Transmission
NESDIS	National Environmental Satellite Data and Information Service
NOAA	National Oceanic and Atmospheric Administration
UTC	Universal Coordinated Time
WEFAX	Weather Facsimile

Frequencies

NOAA-14 transmits APT on 137.62 MHz
NOAA-12 and NOAA-15 transmit APT on 137.50 MHz
NOAAs transmit beacon data on 137.77 or 136.77 MHz
Meteor 3-5 may transmit APT on 137.30 MHz when in sunlight
Resurs 1-4 transmits APT on 137.85 MHz
Okean-O, Okean-4 and Sich-1 sometimes transmit APT briefly on 137.40 MHz
GOES-8 and GOES-10 use 1691 MHz for WEFAX

THE FED FILES

A GUIDE TO GOVERNMENT COMMUNICATIONS

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"Summertime and the living is easy..."

As I write this month's column, the weather is fixing to turn cold again here in the mountains of western North Carolina. But I am fantasizing about warmer weather; I'm sitting back in my easy chair thinking about a lazy summer day in a boat on the water. However, there is a group of professionals who have a completely different view of the boating season on the nation's waterways. They are Coast Guardsmen from the United States Coast Guard.

So that you can follow some of the action, this month we will profile some of the Coast Guard frequencies used throughout the radio spectrum.

❖ Weather and Marine Information HF Radio Systems

The U.S. Coast Guard broadcasts National Weather Service offshore forecasts and storm warnings of interest to the mariner on 2670 kHz following an initial announcement on 2182 kHz. Typical transmission range is 50-150 nautical miles during the day and 150-300 nautical miles at night. These broadcasts are prepared by the Marine Prediction Center, Tropical Prediction Center, Anchorage Forecast Office and Honolulu Forecast Office.

The table below is a listing of current broadcast schedules of U.S. Coast Guard Groups performing medium frequency (MF) voice broadcasts. In the state of Alaska, medium frequency (MF) voice broadcasts are performed from National Weather Service Forecast Offices on a frequency of 4125 kHz . Mode for these transmissions is upper sideband (USB) and times are UTC.

Freq kHz	Use
2182	Present calling frequency
2185.5	Digital Selective Calling
2187.5	Future calling frequency
2670	Marine Information Broadcast frequency
4125	Distress, Safety and Calling (Alaska)

Station	Times of transmission
Mobile, AL	1020/1220/1620/2020
Los Angeles/Long Beach, CA	0503/1303/2103
San Francisco, CA	0203/1403
Mayport, FL	0620/1820
Miami, FL	0350/1550
St. Petersburg, FL	0320/1420
Apra Harbor, Guam	0705/2205
Honolulu, Hawaii	0545/1145/1745/2345
New Orleans, LA	0550/1035/1235/1635/2235
Boston, MA	1035/2235
Woods Hole, MA	0440/1640
Eastern Shore, MD	0233/1403
Portland, ME	1105/2305
Southwest Harbor, ME	1135/2335
Cape Hatteras, NC	0133/1303
Fort Macon, NC	0103/1233
Atlantic City, NJ	1103/2103
Moriches, NY	0010/1210
Astoria, OR	0533/1733
Humboldt Bay, OR	0303/1503
North Bend, OR	0603/1803
Greater Antilles Section, PR	0305/1505
Charleston, SC	0420/1620
Corpus Christi, TX	1040/1240/1640/2240
Galveston, TX	1050/1250/1650/2250
Hampton Roads, VA	0203/1333
Port Angeles, WA	0615/1825

NAVTEX is an international automated medium frequency (518 kHz) direct-printing service for delivery of navigational and meteorological warnings and forecasts, as well as urgent marine safety information to ships. It was developed to provide a low-cost, simple, and automated means of receiving this information aboard ships at sea within approximately 200 nautical miles of shore. NAVTEX stations in the U.S. are operated by the U.S. Coast Guard. There are no user fees associated with receiving NAVTEX broadcasts.

HF SITOR NBDP Broadcast

NMC Point Reyes, CA	8416.5 16806.5
NMF Boston, MA	6314 8416.5 12579 16806.5
NMO Honolulu, HI	8416.5 12579 22376
NOJ Kodiak, AK	6264.3
NRV Apra Harbor, Guam	12579 16806.5 22376

HF SITOR NBDP Calling/Working (coast/ship)

NMC Point Reyes, CA	6323.5/6272.5 8426/8386 16816.5/16693
NMO Honolulu, HI	8429.5/8389.5 12589/12486.5 22389.5/22297.5
NOJ Kodiak, AK	4213.5/4175.5 8419/8379.5
NRV Apra Harbor, HI	8422/8382 12585/12482.5 16812.5/16689 22382/22290

RadioFax Broadcast Frequencies

2054	AK	Kodiak NOJ
4235	MA	Boston NMF
4298	AK	Kodiak NOJ
4317.9	LA	New Orleans NMG:
4346	CA	Point Reyes NMC
6430.5	MA	Boston NMF
8459	AK	Kodiak NOJ
8503.9	LA	New Orleans NMG
8682	CA	Point Reyes NMC
9110	MA	Boston NMF
12412.5	AK	Kodiak NOJ
12730	CA	Point Reyes NMC
12750	MA	Boston NMF
12789.9	LA	New Orleans NMG
17151.2	CA	Point Reyes NMC
22527	CA	Point Reyes NMC

❖ HF Voice Radio Systems

The U.S. Coast Guard broadcasts National Weather Service high seas forecasts and storm warnings from six high seas communication stations. These broadcasts are prepared cooperatively by the Marine Prediction Center, Tropical Prediction Center and Honolulu Forecast Office. U.S. Coast Guard HF voice broadcasts are performed in the upper sideband mode using a synthesized voice known as "Perfect Paul." This voice is very distinctive and serves as in aid in identifying and copying these weather broadcasts.

4316	LA	New Orleans NMG (relays CAMSLANT broadcasts)
4426	VA	Chesapeake NMN CAMSLANT (ITU Marine channel 424)
	CA	Point Reyes NMC CAMSPAC
6501	Guam	Apra Harbor NRV (ITU Marine Channel 601)
	VA	Chesapeake NMN CAMSLANT
	HI	Honolulu NMO
	AK	Kodiak NOJ
8502	LA	New Orleans NMG (relays CAMSLANT broadcasts)
8764	VA	Chesapeake NMN CAMSLANT (ITU Marine Channel 816)
	HI	Honolulu NMO
	CA	Point Reyes NMC CAMSPAC
12788	LA	New Orleans NMG (relays CAMSLANT broadcasts)
13089	Guam	Apra Harbor NRV (ITU Marine Channel 1205)
	VA	Chesapeake NMN CAMSLANT
	HI	Honolulu NMO
	CA	Point Reyes NMC CAMSPAC
17314	VA	Chesapeake NMN:CAMSLANT (ITU Marine Channel 1625)
	CA	Point Reyes NMC CAMSPAC

Other HF Radio Networks

There are quite a few voice radio networks run by the U.S. Coast Guard. Here is a sampling of those nets.

Coast Guard Air-to-Ground Frequencies

3053 3560 3119 3122 4730 4733 5692 5693 5696 5699 6742 8980 8983 11196 11199
11202 13218 13221 15082 15085 15088 17988 17991

Ship to Shore Independent Sideband Nets

2016 2040 2054 2144 2161 4913.5 5108.5 5217 5223 5266 5272 (3-E-6) 5418 (ANDVT) 5418.5 5419.5 5932.5 6234.5 (3-E-4) 6246.6 (ANDVT) 6815.6 (3-E-11) 6960 (ANDVT) 6961 7439 7576 (ANDVT) 7577 (ANDVT) 7617 (ANDVT) 7618 (ANDVT) 7626 (3-E-10) 7713 7754.5 7783 (3-E-11) 7845 (3-E-12) 7882.5 (ANDVT) 7884 (3-E-13) 7909 (3-E-14) 9169 9291 9299.5 9332 (ANDVT) 9373 10296 (ANDVT) 10297.5 (ANDVT) 10298 (ANDVT) 10338.5 10353 (ANDVT) 10354.5 (ANDVT) 10378 10608.1 (3-E-5) 10675 (3-E-19) 10759 (3-E-20) 10788 (3-E-21/ANDVT) 10789 (ANDVT) 10929.5 10935.5 11024 11043.5 (ANDVT) 11045 11157.5 (3-E-24) 11165.8 13413 (3-E-25) 13484 13537.7 13950 14506 14518.7 14731 14752 14919.2 18189 18255 18283 18335 18497 18650 18716 18757 (ANDVT) 20095 20137

Coast Guard Domestic Fixed Emergency Net/SHARES Frequencies
(Nationwide)
4048.5 7528.5 11434.5 15473.5

Miscellaneous HF Frequencies

4153.6	Navy/Coast Guard Ship-to-Shore Data Link
4243.0	USCG Caribbean/Gulf of Mexico High Frequency Data Link
5142.6	7th CG District SAR Tactical (Charleston, SC; Mayport, FL; Miami, FL)
5320.0	7th District Operations Working Simplex (Greater Antilles Section, Miami) 8th District Operations Working Simplex
5399.6	Greater Antilles Section ANDVT frequency (3-C-16)
5422.5	District Operations Working Simplex/Intra-CG HF Working Simplex/Special Air/Sea Operations (3-A-3)
6015.6	Greater Antilles Section Air-to-Ground Guard frequency
6200.0	Ship-to-Shore SSB Duplex Channel 601 (paired with 6501 kHz)
6212.0	Ship-to-Shore SSB Duplex Channel 605 (paired with 6513 kHz)
6501.0	Ship-to-Shore SSB Duplex Channel 601 (paired with 6200 kHz)
6815.6	Greater Antilles Section Tactical Discrete
8240.0	Ship-to-Shore SSB Duplex Channel 816
6958.0	PACTOR 200/100 Net for PAC Cutters with email
7421.0	Coast Guard Special Air/Sea Operations (3-A-9)
7629.1	9th District Coast Guard Secure/Non-Secure HF Local Air/Surface Net
7651.6	7th District Coast Guard Counter-Narcotics Operations
7773.5	Coast Guard Special Air/Sea Operations (3-A-8)
8024.0	CAMSLANT Chesapeake Tactical Discrete
8027.6	St. Petersburg Group Tactical Discrete
8340.2	Pacific Coast Guard G-TOR Digital Net
8240.0	Ship-to-Shore SSB Duplex Channel 816 (paired with 8764 kHz)
8764.0	Ship-to-Shore SSB Duplex Channel 816 (paired with 8240 kHz)
9001.5	8th District Operations Working Simplex/Tactical (ANDVT)
9283.6	Greater Antilles Section Tactical Discrete
10343.0	CAMSLANT Chesapeake, VA HF Data Link
10608.0	7th District Coast Guard Counter-Narcotics Operations (ANDVT)
10993.6	7th District Coast Guard Counter-Narcotics Operations
11184.0	Coast Guard Counter-Narcotics Operations
11434.0	CAMSLANT Chesapeake Ship to Shore communications
12242.0	Ship-to-Shore SSB Duplex Channel 1205 (paired with 13089 kHz)
12378.0	CAMSLANT Chesapeake, VA HF Data Link
12405.0	Coast Guard Counter-Narcotics Operations (ANDVT)
13089.0	Ship-to-Shore SSB Duplex Channel 1205 (paired with 12242 kHz)
13932.2	Pacific Coast Guard G-TOR Digital Net
16432.0	Ship-to-Shore SSB Duplex Channel 1625 (paired with 17314 kHz)
17314.0	Ship-to-Shore SSB Duplex Channel 1625 (paired with 16432 kHz)
18971.0	Coast Guard Tactical Net

❖ Coast Guard VHF/UHF Radio Systems

HF radio isn't the only place that you will find Coast Guard communications nets. The VHF/UHF spectrum also has its share of Coastie transmissions. In the next edition of MT's *The Fed Files* we will explore that portion of the spectrum.

And that is it for this month's edition of *The Fed Files*. Now it is time to look at this month's federal spectrum scan in Table One. In this issue we continue our detailed look at the reorganized 406-420 MHz UHF federal land mobile service. 73 and good hunting.

Table One: Federal UHF Land Mobile Service

Frequency	*Ch/Paired Freq*	*Agencies*
414.0000	632/Simplex	Drug Enforcement Agency, FBI (Nationwide)
414.0125	633/Simplex	(No reported activity)
414.0250	634/Simplex	FBI (Nationwide), Immigration and Naturalization Service, Veterans Administration
414.0375	635/Simplex	Interagency Law Enforcement UHF National Calling Channel (Simplex-167.9 Hz PL-NAC $68F) [Justice Department-Nationwide]
414.0500	636/Simplex	Drug Enforcement Agency, FBI (Nationwide), Immigration and Naturalization Service, Marshals Service
414.0625	637/Simplex	Interagency Law Enforcement UHF Interoperability Channel <Inop 4> (Simplex -167.9 Hz PL-NAC $68F)
414.0750	638/Simplex	Drug Enforcement Agency, FBI (Nationwide)
414.0875	639/Simplex	(No reported activity)
414.1000	640/Simplex	FBI (Nationwide)
414.1125	641/Simplex	(No reported activity)
414.1250	642/Simplex	Drug Enforcement Agency, FBI (Nationwide)
414.1375	643/Simplex	(No reported activity)
414.1500	644/Simplex	Army, Drug Enforcement Agency, FBI (Nationwide)
414.1625	645/Simplex	(No reported activity)
414.1750	646/Simplex	Drug Enforcement Agency, FBI (Nationwide)
414.1875	647/Simplex	(No reported activity)
414.2000	648/Simplex	Army, Drug Enforcement Agency, FBI (Nationwide), Navy
414.2125	649/Simplex	(No reported activity)
414.2250	650/Simplex	Drug Enforcement Agency, FBI (Nationwide)
414.2375	651/Simplex	(No reported activity)
414.2500	652/Simplex	FBI (Nationwide)
414.2625	653/Simplex	(No reported activity)
414.2750	654/Simplex	Drug Enforcement Agency, FBI (Nationwide)
414.2875	655/Simplex	(No reported activity)
414.3000	656/Simplex	FBI (Nationwide)
414.3125	657/Simplex	Interagency Law Enforcement UHF Interoperability Channel <Inop 5> (Simplex -167.9 Hz PL-NAC $68F)
414.3250	658/Simplex	Drug Enforcement Agency, FBI (Nationwide), IRS, Post Office, Veterans Administration (Nationwide)
414.3375	659/Simplex	Interagency Law Enforcement UHF Interoperability Channel <Inop 6> (Simplex -167.9 Hz PL-NAC $68F)
414.3500	660/Simplex	Drug Enforcement Agency, FBI (Nationwide)
414.3625	661/Simplex	(No reported activity)
414.3750	662/Simplex	FBI (Nationwide)
414.3875	663/Simplex	(No reported activity)
414.4000	664/Simplex	Air Force, Drug Enforcement Agency, FBI (Nationwide), Forest Office, Post Office, Veterans Administration (Nationwide)
414.4125	665/Simplex	(No reported activity)
414.4250	666/Simplex	Drug Enforcement Agency, FBI (Nationwide)
414.4375	667/Simplex	(No reported activity)
414.4500	668/Simplex	Drug Enforcement Agency, FBI (Nationwide), Post Office
414.4625	669/Simplex	(No reported activity)
414.4750	670/Simplex	Drug Enforcement Agency, FBI (Nationwide), GSA
414.4875	671/Simplex	(No reported activity)
414.5000	672/Simplex	Drug Enforcement Agency, FBI (Nationwide)
414.5125	673/Simplex	(No reported activity)
414.5250	674/Simplex	Drug Enforcement Agency, FBI (Nationwide)
414.5375	675/Simplex	(No reported activity)
414.5500	676/Simplex	Drug Enforcement Agency, FBI (Nationwide)
414.5625	677/Simplex	(No reported activity)
414.5750	678/Simplex	Drug Enforcement Agency, FBI (Nationwide), Marshals Service
414.5875	679/Simplex	(No reported activity)
414.6000	680/Simplex	Drug Enforcement Agency, FBI (Nationwide)
414.6125	681/Simplex	(No reported activity)
414.6250	682/Simplex	Army, Commerce Department (Nationwide), National Weather Service
414.6375	683/Simplex	(No reported activity)
414.6500	684/Simplex	Agriculture Department (Nationwide), Agriculture Stabilization and Conservation Service, Animal and Plant Health Inspection Service, Bureau of Land Management (Nationwide), Forest Service (nationwide), Post Office
414.6625	685/Simplex	(No reported activity)
414.6750	686/Simplex	Secret Service (Nationwide)
414.6875	687/Simplex	(No reported activity)
414.7000	688/Simplex	IRS (Nationwide)
414.7125	689/Simplex	(No reported activity)
414.7250	690/Simplex	Air Force, Army, Energy Department, FAA, Federal Reserve System, Post Office (Nationwide), Veterans Administration
414.7375	691/Simplex	(No reported activity)
414.7500	692/Simplex	Federal Trunk Group 2 (paired with 406.7500): Air Force, Army, Bureau of Prisons, Energy Department, Navy, Post Office (Nationwide)
414.7625	693/Simplex	Coast Guard
414.7750	694/Simplex	Energy Department, Labor Department (Nationwide)
414.7875	695/Simplex	(No reported activity)
414.8000	696/Simplex	Customs Service (Nationwide), Federal Reserve System, Secret Service, Treasury Department (Nationwide)
414.8125	697/Simplex	(No reported activity)
414.8250	698/Simplex	Bureau of Indian Affairs, Bureau of Land Management, Bureau of Mines, Bureau of Reclamation, Energy Department, Fish and Wildlife Service, General Accounting Office, Geological Survey, Interior Department (Nationwide), National Park Service, TVA
414.8375	699/Simplex	(No reported activity)
414.8500	700/Simplex	Secret Service
414.8625	701/Simplex	(No reported activity)
414.8750	702/Simplex	Architect of the Capitol, Army, Bureau of Indian Affairs, Bureau of Land Management, Energy Department, Fish and Wildlife Service, Interior Department (Nationwide), TVA, Veterans Administration
414.8875	703/Simplex	(No reported activity)
414.9000	704/Simplex	IRS (Nationwide)
414.9125	705/Simplex	(No reported activity)
414.9250	706/Simplex	Air Force, Bureau of Land Management, Commerce Department, Energy Department, Maritime Administration, NASA
414.9375	707/Simplex	(No reported activity)
414.9500	708/Simplex	Federal Trunk Group 4 (paired with 406.9500): Secret Service
414.9625	709/Simplex	(No reported activity)
414.9750	710/Simplex	Air Force, Bureau of Land Management, Bureau of Reclamation, Energy Department, FAA, Interior Department (Nationwide), Post Office, TVA
414.9875	711/Simplex	(No reported activity)

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The Price of Progress

As we've discussed in previous columns, numerous public safety agencies are transitioning from older radios to new systems in the 800 Megahertz (MHz) frequency range. These new trunked radio systems promise digital clarity, interoperability with other jurisdictions, and the ability to handle a greater number of users. However, many agencies have also experienced a number of significant and potentially life-threatening problems with the reliability and usability of these more complex radios, as we can see in this letter from the mailbag:

Dan,

I am an officer with the Washington, D.C. Fire Department. On January 2, 2001, we switched over to an 800 MHz digital Motorola trunked radio system. My professional opinion? It should be outlawed! I cannot believe that the city managers responsible for these systems have not been forthcoming with the serious defects in a trunked system. I work downtown Washington and there are a lot of large, modern office buildings. Once we get in about ten feet into a building the radios "honk out" and we have to switch to talkaround. We had a small fire in a storage room at a below-grade subway station where we played "radio relay" to get information to and from the Incident Commander.

Thank God no one got hurt.

Anyway, I am collecting information on 800 MHz systems about known defects and possible solutions. I have read your columns posted on the Signal Harbor web site. I was wondering if you could point me to where on the web I might find more information.

I like your web site. Keep up the good work.

Besides Washington, D.C., municipalities in California, Delaware, Georgia, Missouri, New York, and Oregon have had their officers' lives put at risk due to radio system problems.

❖ Coverage

The primary complaint from users of these new 800 MHz systems is that there are gaps, or "dead zones," where there is no service. If you've ever tried to use a cellular telephone in a remote or rural area you may have experienced the NO SERVICE warning on your phone because it wasn't close enough to a cell tower to receive a signal. The same kind of phenomenon is happening with 800 MHz digital radios, where the signal from the repeater tower is too weak, too distorted, or too far away to reach.

Many older public safety radio systems operate at much lower frequencies, primarily in the 400 MHz and 150 MHz bands. One characteristic of 800 MHz radio signals is that they do not penetrate buildings and other structures as well as those lower frequencies. So, in order to have the same level of coverage with an 800 MHz system as you would with a lower frequency system, you end up needing more towers. This increases the expense and effort involved in fielding a new system, and a number of cities have been reluctant to spend additional money to fill in these gaps.

❖ Interference

Public safety users are not alone in the 800 MHz band. Other users include cellular telephone systems and Specialized Mobile Radio (SMR) operators. The largest and most pervasive SMR operator is Nextel Communications, Inc., which has built numerous radio towers across the country to provide coverage for their subscribers. Unfortunately, for historical reasons the radio frequencies used by Nextel are adjacent to public safety channels, and there is often a significant amount of interference where they coexist.

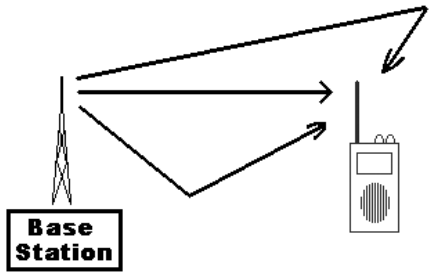
The task of establishing rules and procedures to eliminate this kind of interference ultimately falls to the Federal Communications Commission (FCC). Many years ago, when the FCC originally granted the Nextel frequencies, the SMR business was basically limited to trucking and taxicab dispatch operations, which required relatively few towers. Public safety systems, too, were designed with the expectation that adjacent frequencies would not be heavily used.

Now, with Nextel selling large numbers of handheld radios, SMR towers are popping up everywhere. Although Nextel insists they are operating within FCC guidelines, new 800 MHz public safety radio systems in many parts of the country are overwhelmed by these signals.

Nextel is not the only culprit, since cellular telephone systems are also widespread and operate very close to public safety frequencies.

Last year a number of parties brought together by the FCC formed a working group to study ways of reducing or eliminating interference between public safety systems and the cellular and SMR networks. Members of the working group include the Association of Public Safety Communications Officials International, Inc. (APCO), Motorola, and Nextel.

In parallel, the FCC is currently considering the rules for use of the 700 MHz frequency band, soon to be vacated by UHF television broadcasters. Public safety agencies are looking forward to 700 MHz as a way to ease overcrowding in the 800 MHz band and greatly reduce potential interference. However, despite a promise to protect public safety radio users, the FCC is under pressure from Congress to auction off as much 700 MHz spectrum as they can to commercial users. In doing so they may once again create rules that foster the interference occurring today.



Multipath

❖ Multipath

Another type of interference occurs because of the nature of 800 MHz signals, which have a tendency to bounce off large flat surfaces like billboards and the sides of buildings. All of the resulting reflections combine with the unreflected signal to create a condition at the radio known as *multipath.* Each copy of the signal takes a different path to

reach the radio (that is, multiple paths) and therefore arrives at the radio at a slightly different time than all the rest. These multiple overlapping signals interfere with each other and many times the original signal is so distorted that it cannot be recovered.

Multipath is highly dependent upon the exact location and orientation of the receiver as well as the relative locations of reflective surfaces. This makes it a significant challenge to predict exactly where such a condition may occur.

❖ Digital Signals

These new systems are almost always operated in digital mode, which means that the voice and message information are transmitted as series of binary digits (bits) rather than a continuous analog signal. When a digital signal encounters interference, the ones and zeroes of the transmission are overwritten or distorted and the radio that is receiving the signal may not be able to accurately reconstruct the original message. If the transmission is so badly garbled that the receiver cannot make sense of it, the typical action is to mute the speaker, meaning the user hears nothing.

With an analog system, interference results in irritating noises and other difficulties, but often the human ear can pick out the voice amid all the audio clutter. Shortwave listeners are especially good at this, since many times the signal from half way around the world has a lot of noise that comes along with it! A digital system, in contrast, will simply blank the audio and provide no information to the user, leaving them wondering whether the system is working at all. This also makes it difficult for a user to determine the source of the interference.

❖ Software Bugs

These new systems are much more complicated than their predecessors, with all of the new features and capabilities that a digital trunked system can bring. These features require a good deal of computer software, both inside the mobile radios (sometimes referred to as *firmware*) and at repeaters and dispatch centers. Any software this complex will have bugs, and sometimes these bugs only manifest themselves during unusual conditions. Since Murphy's Law ("anything that can go wrong will go wrong, and at the worst possible time") holds true for software, these bugs often appear only during very busy or critical times that are hard to reproduce in a manufacturer's development laboratory. Nashville's new trunked system, for example, experienced a serious problem on Election Night last November and shut itself down just before the evening festivities were to begin.

❖ Operator Error

To be fair, some problems can be chalked up to lack of training and user inexperience. The simple "push-to-talk" microphone has been enhanced with a number of additional features and capabilities, some of which can be confusing. These radios must also be properly programmed before being put into service, and mistakes in programming have been known to happen.

When operating in digital mode, the radios must perform a conversion between the analog voice coming into the microphone and the digital bits being transmitted out the antenna. This conversion takes a certain amount of time, creating a momentary delay that takes some getting used to. If the user is not comfortable and confident in the way a radio operates, the effectiveness and usefulness of that radio is greatly reduced.

❖ Talkgroup Patterns

Dan:

I have enjoyed your articles on Trunking over the past year – especially the one in the April issue where you discuss the "formation" of talkgroups. In some ways, it's still confusing but in most ways that clears up a lot of questions. One thing – what "code" do the Motorola people actually work with to "form" the talkgroups and IDs? For example, our Health Services System has 4 "tac" talkgroups - 36208 - 36240 - 36272 and 36304. When I convert these to Hex or Binary I still see no "sequence" to these numbers. Just what do the radio people use to set the system up?
- Al in Nova Scotia, Canada

Thanks, Al, but don't hold out on us – send in the frequencies you're monitoring as well! Here are the talkgroups mentioned in the letter, along with their hexadecimal and binary equivalents:

Decimal	Hex	Binary
36208	8D70	1000110101110000
36240	8D90	1000110110010000
36272	8DB0	1000110110110000
36304	8DD0	1000110111010000

The pattern that I see in the talkgroups is apparent in the last two digits of the hex representation. Without knowing anything else about the system, I'd have to say that this is a Motorola Type II system and these are normal talkgroups. Recall that in a Type II system the last hex digit (the last four bits of the 16-bit talkgroup value) represent special conditions for the talkgroup.

In general, the assignment of actual talkgroup numbers typically depends on how the system is shared. A designer has to take into account all of the agencies and organizations that may use the system, how many talk groups each organization will need, and make some guesses as to how the users may access the system. Also, many systems start out small and gradually add more users, so the original talkgroup plan may have to be modified as the system grows.

That's all for this month. Get out there and enjoy the summertime, and be sure to send me the frequencies and talkgroups for the agencies you're monitoring. I can be reached via electronic mail at *dan @ signalharbor.com*, and you're welcome to visit my website at ***http://www.signalharbor.com***. Until next month, happy monitoring!

PLANE TALK

Jean Baker
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Tampa Bay Airspace and Flight Explorer

Welcome aboard! Thanks to everyone who has been contributing so much to our column, especially lately. We do appreciate it! Can you believe that I just celebrated my 16th year of writing "Plane Talk" for *MT*? How time has flown! This has become one of my favorite activities for our hobby.

First on our list today are frequencies from the Tampa Bay area, contributed by Mark Kortvely, Sr. (Florida). He reports that the info came from the Jepson Florida Airway Express Manual, dated 11/30/00 to 01/25/2001. Mark also mentions that to the best of his knowledge, the frequencies are still active and have not changed for some time.

Tampa International Airport (TPA)
118.15 Approach (001-090)
118.15 Departure (001-150)
118.5 Approach (Final)
118.8 Departure (220-360)
119.5 Tower
119.65 Departure (151-219)
121.7 Ground
122.45 FSS (Flight Service Station)
122.95 FBO: Raytheon Aircraft Services
123.6 FSS
126.45 ATIS (Arrival)
128.47 ATIS (Departure)
130.57 ARINC
133.6 Clearance Delivery

St. Petersburg/Clearwater International Airport (PIE)
121.3 Tower
121.9 Ground
120.6 Clearance Delivery
122.2 FSS
122.95 FBO: Jet Exec Center
122.95 FBO: Signature Flight Support
123.6 FSS
125.3 Tampa Approach/Departure (also hand-off from 118.8)
131.97 FBO: Jet Exec Center
134.5 ATIS

Notes: Local home base for United Parcel Service where they base three Boeing 757s and occasionally a B727QF. Several Canadian charters fly into PIE, namely Air Transaat, Canada 3000, and Royal. The Pinellas County Sheriff has their flight support section here as well as the U.S. Coast Guard Air Station.

Albert Whitted Airport (SPG)
118.87 ATIS
119.65 Tampa Approach/Departure
121.8 Ground
122.96 FBO: Bay Air Services
123.05 West Florida Helicopters
125.3 Tampa Approach/Departure
127.4 Tower

Sarasota/Bradenton Airport (SRQ)
118.25 Clearance Delivery
119.225 AWOS-3 (Automated Wx)
119.65 Tampa Approach/Departure
120.1 Tower
121.9 Ground
122.95 FBO: Dolphin Aviation
123.5 Jones Aviation Services
124.95 Sarasota Final (4000-ft and below)
134.15 ATIS

Other frequencies in the area are: ACARS Data: 129.150, 130.025, 131.550; Miami Center: 128.225 and 133.9 - High and Low altitude.

❖ Air Traffic Cafe'

An extremely fascinating and informative site on the web for subscribers well-acquainted with ATC as well as neophytes to the subject is The Air Traffic Café Website, located at ***http://www.airtrafficcafe.com*** As stated in the introduction "Our goal is to improve quality, safety, and awareness within the ATC system through education and discussion. Air Traffic Control is a complex environment and can be overwhelming to the uninformed. With the aid of ATCafé we hope to provide a more clear and broader insight to the workings of air traffic control as it relates to aviation, air travel, and occupational duties. If this is your first visit, or you have a specific question you need answered, we suggest you start your tour by reading our Help/FAQ (frequently asked questions) section."

I've found this site to be the best of its kind on the internet today. It's filled with information and areas continually updated to hold the readers' interest, and encourages further exploration of the subject. For instance, there are areas within the site covering Live ATC, ATC Jobs, ATC History, Training Information, Facilities, Book Reviews, Articles, Aviation Related News, and Links. Gate-To-Gate is a multimedia experience that introduces you to the air traffic management system, the people, tools and work of air traffic control – an experience not to be missed! Tell 'em you saw it in *Monitoring Times*!

❖ Chicago Surfing

Another website that will catch your eye is the NATCA (National Air Traffic Controllers' Association) Chicago O'Hare TRACON at ***http://www.thetracon.com*** Here, you'll find News, Multimedia, The Funnies (hilarious ATC/Aviation jokes and stories), Events, ATC Links (to just about every website concerning ATC, both domestic and international), Public BBS, Guest Book, Live ATC, and much more. Here are some frequencies from the TRACON for the Chicago area:

Chicago Approach (and Departure) Control Frequencies:
118.92 Arrival (ORD*)
119.0 East Arrival (ORD)
124.35 East Feeder (ORD)
124.35 Arrival (ORD)
126.05 Arrival (ORD)
128.45 West Arrival (ORD)
128.57 Arrival (ORD)
135.02 Arrival (ORD)
135.07 West Feeder (ORD)
118.4 Sector 1, South Satellite (MDW*)
119.35 Sector 2, South Satellite (MDW, JOT*, LOT*)
124.42 South Satellite
127.87 Sector 4, South Satellite (MDW, CGX*, GYY*)
132.75 South Satellite
133.1 South Satellite
133.5 South Satellite, Sector 3 (MDW, ARR*, DPA*)
ORD* O'Hare, MDW*- Midway, JOT*- Joliet, LOT* Lewis University Airport, ARR*-Aurora Municipal Airport (IL), DPA* DuPage Airport (IL), CGX*-Meigs Field, (Chicago), GYY*-Gary (Indiana).
124.7 West Departure (ORD)
125.0 East Departure (ORD)
127.4 South Departure (ORD)
132.3 North Departure (ORD)
120.55 North Satellite, (PWK*, UGN*, 3CK*)
PWK* Palwaukee (IL), UGN*-Waukegan Airport (IL), 3CK* - Lake in the Hills Airport (IL)
126.58 VFR Advisories

Local Tower Frequencies:
120.75 ORD - South Local
121.6 ORD - Ground Metering
121.75 ORD - Clearance Delivery
121.75 ORD - Outbound Ground
121.9 ORD - Inbound Ground

126.9 ORD - North Local
132.7 ORD - Local 3
118.7 MDW- Local
119.45 MDW- Class C
119.9 PWK - Local
120.05 UGN - Local
120.06 ARR - Local
121.3 CGX - Local
125.6 GYY - Local

Thanks to Cris Johnson of the TRACON who added these frequencies to the website!

❖ Flight Explorer Personal Edition

How would you like to be able to see on your computer screen what Air Traffic Controllers can see on their scopes? It can be done with the help of an outstanding program called Flight Explorer (Personal Edition) produced by Dimensions International, an aviation consulting firm headquartered in Alexandria, VA.

Michael D. Busch, the Editor-In-Chief of the popular *Avweb*, an aviation magazine and news service on the Internet, has kindly given us permission to excerpt from his Flight Explorer PE review article (to read the whole article, please go to ***http://www.avweb.com/sponsors/fe/review.html***).

Flight Explorer (FE) runs as an application under Windows 95, 98, NT 4.0, or Me. Before you can use FE, you have to subscribe to the FE service and receive a user ID and password. A basic subscription fee of $9.95 covers up to 10 hours a month of usage; 10 to 50 hours is charged at $1.95 an hour. If you use more than 50 hours in a month, the fee goes up to $3.49 an hour to encourage heavy users to subscribe to the flat-rate$250/month service (which is now called "Flight Explorer Professional") Here's a closer look at how it works:

"Signup and Installation: Getting started with FE Personal Edition couldn't be simpler. You can sign up for the service at the URL ***http://www.avweb.com/sponsors/fe/*** ...Your FE account is activated instantly, and you can download the FE Personal Edition client software from the same site. The client software is about 3.8 megabytes long, so downloading it over a 28.8 Kbps dial-up connection will take 20 minutes or so.

"The only unusual aspect of the FE installation process is that the installer prompts you for an installation 'codeword' before it will perform the installation. The codeword is emailed to you when you sign up for the FE service."

"Startup: once you've installed the client software on your computer and signed up for the service, you're ready to start using FE... FE starts by putting up a dialog box that asks you to log on with the FE user ID and login password that you received when you signed up for the service.

"After you've entered your login credentials and clicked the 'Connect' button, the software establishes contact with the FE sever over the Internet to authenticate your login and start your FE session. This process normally takes no more than a couple of seconds.

"Once your login has been authenticated, FE displays its default world map, and starts downloading its initial aircraft, track and flight plan information from the FE server, a process that normally takes about a minute (depending on how many aircraft are flying and the speed of your Internet connection).

"As this initial data is downloaded, you'll see the world map become populated with thousands of dots that represent aircraft positions – around 6,000 of them on a typical day, more on a holiday weekend, fewer late at night. At present, you'll see those dots only over North America, the U.K., and major north Atlantic and Pacific oceanic routes. You can expect the rest of Europe to be added as soon as the EU gets its ATC automation together.

"As you watch, you'll see that the dots (airplanes) are moving in near real-time. I say 'near' because although the FE server provides position updates every 10 seconds, the FAA presently proves position updates for each individual aircraft much less frequently than that. The ASDI (Aircraft Situation Display to Industry) data feed may update the position of a particular aircraft as infrequently as every four minutes, although the FAA is already moving to a one-minute update cycle, especially in busy TRACON areas. (Remember, the FAA is providing this data for the benefit of their own flow control folks – we're just looking over their shoulders via the internet.)"

Thanks, Michael. We appreciate your courtesy in letting us use the foregoing material. Don't forget to check into *Avweb*, everyone; it's high on the list of the best aviation websites.

Now I'll add my views on Flight Explorer's really great program! Your credit card is billed monthly for the hours of service that you use. Ten hours of usage per month is only $9.95, which is so nominal compared to some of the other tracking programs I've checked out that it's almost impossible to resist!

Following are some of the software's most interesting features. For instance, there's the ability to zoom in on a region by just dragging a rectangle with your mouse, although it's a tad more difficult to do with a trackball. Since I'm interested in many geographical areas, I have "created" quite a few views to use in addition to the ones that come with the program (Chicago area, Los Angeles, DFW, and the default world view). Creation of views can personalize the program to your own interests and specifications.

The tags on the a/c symbols resemble the data blocks, which appear on an ATC scope (Remember those we saw on the scopes at the Atlanta Center when we toured there during the Grove Expositions?) They contain similar information, such as aircraft callsigns, groundspeed, destination, a/c type, and other data, and you can request the program to display tags for all aircraft on the display; however, this can really clutter up your screen. I just pick out certain aircraft for tag displays; however, this is a personal preference.

Map Overlay controls included are Radar Sites, Airways, Planes, Airports, Navaids, Fixes, and others. In addition, there are quick and advanced filters to manipulate the program to your specifications. One of my favorite features is being able to click on any aircraft to display its destination and additional information.

Another of the program's unique features is the Flight List. Just click on its button and up comes a list of all aircraft that are tracked in the ATC system. It shows all kinds of information that can be sorted by many definitions.

If one of my friends is going on a business trip, I can track their flight from origin to destination with ease. When they tell me that their flight was delayed or on time, I usually grin and say, "Yes, I know."

I could go on and on about FE, but I'd run out of space before I could finish listing all of its features. Believe me, this is a program whose time has come. It's inexpensive, fascinating, and fun to use; by any standards it's the best of the programs available to hobbyists.

That's it for this month, folks. We'll see you all in August with more aero news, views, frequencies, and other assorted goodies. Until then, 73 and out.

Doug Smith, W9WI
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The Grounded Loop antenna

I recently received a letter from Randall Trapp of southern Minnesota detailing the results of a Minnesota DX Club DXpedition to a campground near Faribault. I know those of you who read this column regularly are always interested in new AM DX antennas, and this expedition used one that's new to me.

Randall found the design for the half delta loop in *W1FB's Antenna Notebook,* an American Radio Relay League publication (*by Doug DeMaw, who wrote for MT before his untimely death in 1997-ed*). The classic design was for the 3.5 MHz ham band. It used a 50-foot tower; 110-ft of wire from the top of the tower to the ground; and enough wire to reach from the far end of the 110-ft piece back to the tower as the three sides of a triangle. A low-impedance feed point is at the end of the two wires furthest from the tower.

In theory, all dimensions should be tripled for AM broadcast use. In practice, Randall didn't have any 150-foot trees to work with. He used a bow and arrow to get the wire 55-60 feet up in a tree that was available. This was a three step process; first, monofilament fishing line was shot into the tree; then, it was used to pull a length of heavy-duty string up; finally, the string was used to pull the wire up. 15-gauge aluminum fence wire was used. (I use the same wire for my Beverage antenna. It works great and is dirt cheap.)

The drawing may not show it that well, but as you might guess from the name, this antenna is (almost) a closed loop. It's open only at the feed point. In the original antenna, a metal tower is used as the vertical support. Of course, trees are not nearly as conductive as steel towers; if you use a tree as a support, you have to run a wire up the side of the tree.

With this antenna, good grounds are necessary at the base of the tower and at the feedpoint. Unfortunately, this is difficult to accomplish in Minnesota in February! (The ground freezes down to several feet deep.) Randall was able to use an ice auger (used by ice fishermen) and a fence post driver to drive two 8-foot ground rods. And, somewhat to my surprise, he was also able to retrieve the ground rods after the expedition by using Vice-Grip pliers!

In the initial installation, the feedpoint of the antenna was connected directly to the receiver (a Drake R-8B). On the second day of the expedition, an ICE 180A wire/Beverage matching assembly was added at the feedpoint, with the antenna connected to the 800-ohm tap. This significantly reduced noise pickup.

How did it work? "I noticed a distinctive advantage in the expanded AM band, the 160m amateur band, and the tropical SW band, when compared to the Beverage antennas at my home QTH. However, this being said, I would still say the Beverage antenna is more directive and its basic design favors the lower frequencies..." Of course, it's also bigger!

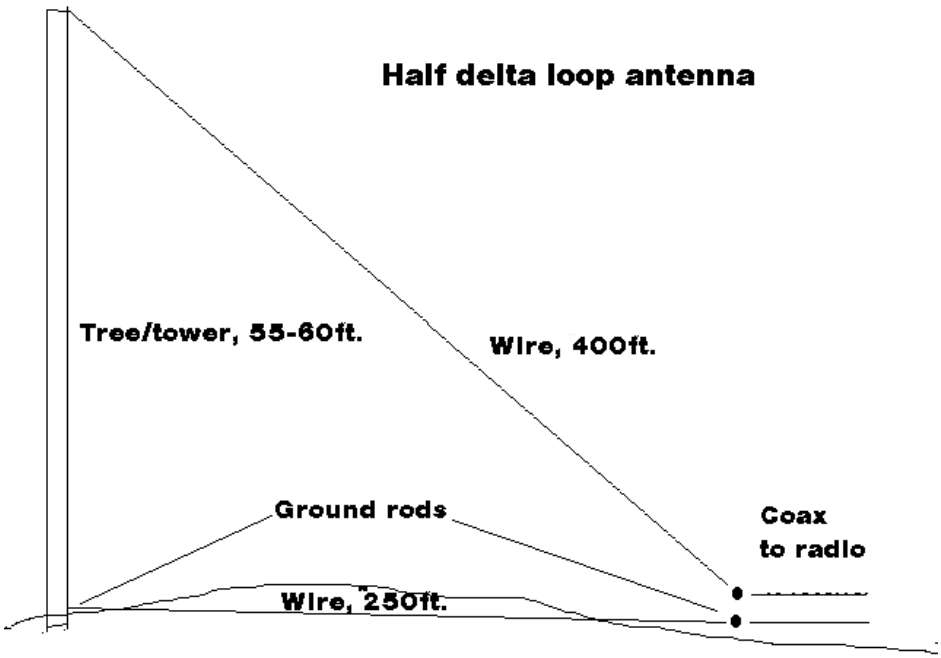
The proof of any antenna is in the log. Randall didn't send any medium wave loggings, but he did forward their longwave broadcast results. From North Africa, Algeria was heard on 153 kHz, and Morocco on 171. And from Europe, BBC Radio 4 on 198 kHz and Atlantic 252 on 252 kHz. These transatlantic longwave signals are excellent catches from that far west!

❖ Bits and Pieces

KRLD and WTIC, both on 1080, tried a "DX non-test" on February 18. KRLD had to replace a defective part in its antenna system, which would require some time off the air. The two stations are co-owned, and their engineers know each other, so they decided to schedule a simultaneous silent period on both stations. KRLD was off from midnight to 12:50am CST; WTIC from 12:35 to 1:31am CST.

Besides eastern DXers logging KRLD while WTIC was off, and westerners hearing WTIC while KRLD was off, a handful of other stations were reported heard in various locations. Most often cited were KSCO (Santa Cruz, CA), WVCG (Coral Gables, FL), WNWI (Oak Lawn, IL), and KOTK. (Portland, OR) This might be one of the advantages of large group ownership; might we see more of these cooperative efforts in the future?

Frozen ground and ice augers probably aren't on anyone's mind right now. We are at the peak of the FM/TV DX season. Are you hearing/seeing anything interesting? Please write: Box 98, Brasstown NC 28902-0098, or by email to *w9wi@w9wi.com.* Good DX!



Here's the half delta loop used by the Minnesota DX Club's winter expedition.

OUTER LIMITS

THE CLANDESTINE, THE UNUSUAL, THE UNLICENSED

George Zeller
georgez@nacs.net

Kentucky Militia Nixes KSMR

The biggest happening in domestic USA clandestine radio history is getting coverage throughout *Monitoring Times* this month. As noted in Washington Whispers and in Glenn Hauser's column, the Kentucky State Militia discarded its affiliation with KSMR. But, the station has returned as United Patriot Radio on 3260 or 6880 kHz slightly irregularly between 0000-0400 UTC. At press time for *MT* this month, they still operate intermittently despite the loss of their militia affiliation, and despite frequent rumors of imminent enforcement action by the FCC.

Summer Propagation

This time of year is a challenge to DXers, with longer daylight hours and more static. Two weekends during the spring featured strong geomagnetic storms, making matters worse. But, even during the summer you can hear pirates if you tune through the 6940-6960 kHz pirate band on weekends. Many stations operate a couple of hours before or after sunset, which is much later than sunset during the winter DX season. But, some pirates propagate about 500 miles from their transmitter site even during the daytime.

What We Are Hearing

MT readers heard every one of these stations this month, all between 6940 and 6955 kHz.

Blind Faith Radio- Dr. Napalm still hangs in there with a steady classic rock format, to which he adds comments promoting pirate radio. (uses blindfaithradio@yahoo.com e-mail)

Crunch Radio- Their eclectic format is hard to predict. They recently featured Dixieland and vintage pop from the 1930's, music seldom heard on shortwave. (None, but has verified Free Radio Network web postings)

DXE- People are still wondering about the true identification of this very interesting recreation of the Lord Haw Haw clandestine broadcasts from Germany in World War II. It is very entertaining, but so far it is mysterious. (None)

Indira Calling- Their East Indian tour by the Beach Boys is amusing, given the Calcutta accent of the announcer. (Providence)

Jean Chretien Station- Canadian politicians do not normally host rock music pirates, but this one uses Chretien's slogan of "We will not let them tear us down," as a slogan. (None)

KHJ- This new operation is among the imitators of commercial FM rock stations. Everybody wants to be Cousin Brucie. (None)

KIPM- Host Alan Maxwell's elaborate psychological dramas generate two reactions: some love them, while some hate them. (Elkhorn)

KRMI- This one has nothing to do with licensed WRMI. Its call letters stand for Radio Michigan International.

Mad Cow Radio- Harold Frodge of *Free Radio Weekly* got a QSL from this new one, which was unidentified when he heard it. We have no clue on their format. (Unknown)

Radio Azteca- Bram Stoker's fast paced satires of DXing and DXers are among the most genuinely entertaining programming on shortwave radio today. (Belfast)

Radio Cochiguaz- Actually located in South America, this one is a great DX catch. If you want to try their shows, they often operate on weekends around 0000 or 0100 UTC on 11400 UTC. (Santiago)

Radio Free Euphoria- Captain Ganja still advocates for marijuana use every chance he gets. (Belfast)

Radio Free Speech- Bill O. Rights features comedy mixed with plugs for individual freedom. (Belfast)

Radio Xanax- The relaxation station still soothes its listeners with a "Don't Worry, Be Happy" format. (Stoneham)

Shadow Radio- This new one has very old programming, consisting mainly of reruns of the old radio show, "The Shadow." (None)

Sycko Radio- Rock and dance music, along with pirate commentary, are the norm here. (Still none)

Voice of Bizarro World- Xhem hosts the only backwards show on shortwave, starting with a sign-off announcement, and ending with a sign-on. (Huntsville)

Voice of Pancho Villa- Normally this one is audible only at the Winter SWL Festival, but you can hear it on the internet at **http://www.dorsai.net/%7Ebigsteve/pancho.ram** in RealAudio. (Blue Ridge Summit)

Voice of the Runaway Maharishi- If you're looking for Eastern philosophy, this is not the place to go. But, the Maharishi does promote drug use continually. (Belfast)

WCFL- There have been a cluster of rock oldies pirate stations using original jingles from the '60's lately. Another example of the genre used these Chicago call letters. (None)

WMFQ- Their rock music and profane identifications have become standard fare on the pirate bands. The obscenities are good natured; they promote the QSL process. (Providence)

WPN- Satire and comedy remain the main focus at Captain Squirtlong's World Parody Network. (Huntsville)

WRX- Jimmy the Weasel has returned with his signature commentary on his "sorry" listeners and their "stinkin" ancestors. (Manomet)

Z-100- This professionally done classic rocker sounds like an imitation of a commercial station. They have acquired an address. (uses biz100fm@yahoo.com e-mail)

Reports and QSLs

Reception reports to pirate stations require three first class stamps for USA maildrops or $2 US to foreign locations. This finances postage for a souvenir QSL to your mailbox. Send your letters to these addresses*:* PO Box 1, Belfast, NY 14711; PO Box 28413, Providence, RI 02908; PO Box 109, Blue Ridge Summit, PA 17214; PO Box 146, Stoneham, MA 02180; PO Box 1464, Manomet, MA 02345; PO Box 11522, Huntsville, AL 35814; PO Box 69, Elkhorn, NE; 68022; and Casilla 159, Santiago 14, Chile. A few pirates, as listed, prefer e-mail, bulletin logs or internet web site reports instead of snail mail correspondence. Reports to the *Free Radio Network* go to ***http://www.frn.net/*** on the web. *Free Radio Weekly* loggings go via ***niel@ican.net*** e-mail. Sample copies of *The ACE* are $2 via the Belfast maildrop.

Thanks

Your input is always welcome via PO Box 98, Brasstown, NC 28902, or via my e-mail address atop the column. We thank all of our contributors: John T. Arthur, Belfast, NY; Artie Bigley, El Paso, TX; Cachito, Santiago, Chile; Jerry Coatsworth, Merlin, Ontario; Steve Coletti, New York, NY; Ross Comeau, Andover, MA; Martin Field, Hillsdale, MI; Harold Frodge, Midland, MI; Captain Ganja, Belfast, NY; Nick Grace, Washington, DC; William T. Hassig, Mt. Prospect, IL; Vince Havrilko, Beale AFB, CA; Harry Helms, San Diego, CA; Chris Lobdell, Stoneham, MA; Greg Majewski, Oakdale, CT; Bill McClintock, Minneapolis, MN; Mike Prindle, New Suffolk, NY; Lee Reynolds, Lempster, NH; Martin Schoech, Merseburg, Germany; John Sedlacek, Omaha, NE; Lee Silvi, Mentor, OH; Bud Stacey, Setsuma, AL; DJ Stevie, Basel, Switzerland; Ray Unger, Front Royal, VA; Edward Walsh, AL; and Niel Wolfish, Toronto, Ontario;

BELOW 500 kHz

DXING THE BASEMENT BAND

Kevin Carey, WB2QMY
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LF Receiving Antennas, Part 1

When it comes to success on longwave, nothing is more important than the antenna you use. Dozens of times I've heard from newcomers who are unable to hear anything below 500 kHz except noise and perhaps a few local beacons. Such problems are often caused by a poor antenna. Starting this month, we will explore three popular antennas for longwave reception: random wires, loops, and active antennas. Each has an advantage under certain conditions, and we'll discuss each type over the next few issues.

❖ The Random Wire – Radio's Workhorse

I call this antenna a "workhorse" because it functions on many bands besides longwave, and can even be used for amateur MF/HF transmitting when paired with a tuner and a good Earth ground. Some folks loosely refer to *all* wire antennas as "longwires," but to meet the criteria for a longwire, an antenna must be a wavelength or more – something that is possible on shortwave, but is rarely the case on LF (a wavelength at 175 kHz is 1750 meters – roughly a mile!).

If you have the room, I recommend putting up a random wire antenna of 75 to 150 feet for all-band reception (see Figure 1). Even if you're planning to add additional, band-specific antennas later on, a random wire will give decent performance over most parts of the spectrum and serve as a general-purpose antenna.

You can get all of the parts needed to build a wire antenna at your local Radio Shack or a hardware store. Almost any kind of wire can be used – bare or insulated (except you must use insulated wire for the lead-in). I've had good luck using galvanized electric fence wire (not aluminum) available at farm and home centers. This wire is inexpensive, strong and easy to solder when new.

Insulators can be purchased outright, or you can make your own by drilling two holes through a piece of Plexiglas or short sections of PVC pipe. Almost any non-conductive material will work. For support ropes, I recommend using a weather-resistant type such as black Dacron. I've had an antenna up for over six years using this type of rope and it shows no signs of wear. It is commonly seen at hamfests and is advertised in many ham radio magazines.

❖ Random Wire Performance

Your success with a random wire antenna depends heavily on your location. City and suburban dwellers may find this type of antenna to be too noisy amidst the sea of TVs, light dimmers, fluorescent lights and other static-generating devices. However, in rural or semi-rural environments a wire antenna that is up high and in the clear can work extremely well. I heard my first lowfer station (225 miles away) on a 100 foot wire antenna several years ago.

If noise is a problem, be sure to "clean" your own house first. Start by turning off dimmers, motors and other possible offenders while monitoring the radio, and see if you can eliminate the noise. Even if you can't get rid of it entirely, you might be able to reduce the noise to an acceptable level.

Random wires can show directional properties, but it is very difficult to predict the response of a given installation due to variables in frequency, height above ground, and wire length. Such discussions are beyond the scope of this article, but there are excellent books that explore the subject in detail, including the *ARRL Antenna Book*.

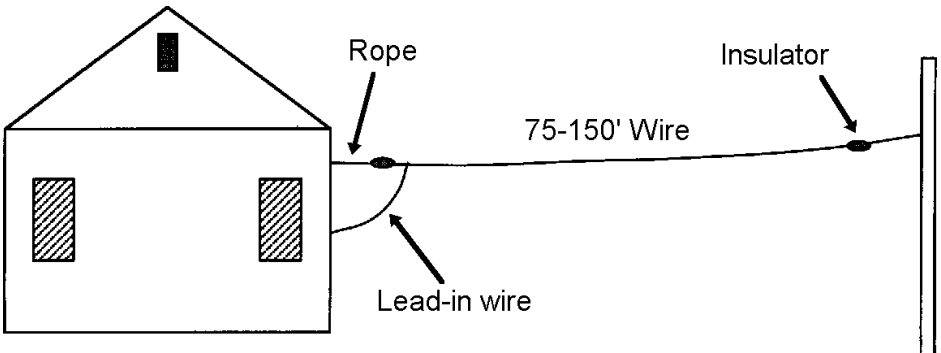

Figure 1. Random wires offer good all-around performance for receiving, and should be a part of any listener's antenna farm.

❖ Mailbag

Do you think DXing is just for radio monitors? David Stadille (CA) tells of a group based out of San Francisco that, many years ago, would go down to the bay near San Jose and listen intently for foghorn sounds! There were reports of hearing horns from the top end of Richmond, approximately 60-70 miles away. Evidently, one of the best listeners was a clarinet player with the San Francisco Symphony.

David and his girlfriend, Cecilia, enjoy tracking down beacons using an old marine radio. He likens these trips to "treasure hunts" in the sunlight. His finds include ***UAR*** near Chualar, CA, ***MR*** on the Monterey Peninsula, ***HGT*** at Fort Hunter-Liggett, CA, and ***PDG*** near Watsonsville, CA. ***PDG*** was located in an especially odd spot – next to a maintenance shed behind a jail. Reaching the beacon involved making a mad dash across a flooded area where their vehicle became stuck, but they managed to get out.

Speaking of bizarre intercepts, Herb Shatz wrote to share his strangest catch in 35 years of DXing. In 1980, from Queens, NY, Herb managed to snag a Traveler's Information Station (TIS) on 530 kHz located at the Cape Hatteras National Seashore. It was audible for several weeks and was quite clear in NY. A phone call to the park confirmed the existence of the approximately 5-watt transmitter. Herb used a 120-foot wire antenna atop a six story building to hear this station.

❖ "Pipeline Reception" Update

In the April issue, I raised the question of why so many Iowa beacons are heard at my location in Western NY, while New England beacons are rarely heard here. Walt Shepherd (CA) wrote with a very plausible explanation: ground conductivity. In the central plains states the ground conductivity is rather good – about 30 millimhos per meter. ("Mhos" are a measure of conductivity and represent the word "ohm" spelled backwards.)

In parts of New England, the ground conductivity averages only 1 or 2 millimhos per meter. This could certainly influence groundwave propagation, and likely explains the disparity between Midwest and New England Beacons. Walt adds that there is a map on the FCC web site at ***www.fcc.gov/mmb/asd/m3/m3.html*** showing the ground conductivity for the entire United States.

See you next month.

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T.J. "Skip" Arey, N2EI
tjarey@home.com

One Ham's Hamfest Perspective

It occurs to me that I have written about hamfests a number of times in the pages of *MT* over the years. However, I have yet to broach the subject since wearing my current mantle of "Amateur Radio Guy."

The summer months usually put any number of hamfests within local driving distance. This isn't to say that they don't occur throughout the year, they just seem to propagate with more frequency in the summer months. (A bit o' ham radio humor there.)

❖ The Great Equipment Swap

As you may well expect, a trip to any hamfest will go a long way toward outfitting your shack. Of course, most hamfests have a number of commercial outfits on hand, often with special "hamfest pricing" on their gear. Not only do you get special pricing, you also save on shipping and handling costs as well. Important thoughts for the frugal (i.e., cheapskate) ham.

But beyond the "company men" (and women), when I think of hamfesting I think mostly of the many rows of pre-owned equipment that one can pick over. In spite of on-line auctions and other Internet resources, hamfests remain the best place to purchase used gear. This is mainly because you get to see the items in question up close and personal. You get to look the seller in the eye and have a round or two of honest to goodness horse trading before the deal goes down.

Further, the seller is usually local enough that questions and concerns after the sale can be reasonably addressed or redressed as the case may be. Not everyone at these gatherings is a "hard boiled" seller. My heart has been warmed a number of times when I have seen a transmitter drop significantly in price for a young person getting started in the hobby or an older person on a fixed income.

On the other hand, you can set up a table and clean out a bit of gear yourself. I had a major "shack cleaning" prior to a move once. I found that running a table was in some ways more fun than walking around poking my nose into other people's tables. I found myself talking to a lot of folks about a lot of things – the equipment I was selling serving as the foil by which many larger issues were discussed. I also took home enough legal tender to buy the better part of a slightly less used transceiver than the one I was currently plying the airwaves with.

Once or twice I've sold something – sure it was no longer of use to me – and at some time down the road wished I had it back. This is how the hamfest cycle completes itself…heading down the isles in search of replacements for passed on gear. I've lost track of the number of Heathkit HW-8's I've bought and sold for just this reason.

❖ Sitting for the Test

A large number of hamfests offer VE testing on site. Often this is the most convenient place to go to take that first test or to upgrade your existing privileges. I often wander over toward the VE testing sessions to see the looks of excitement on the faces of folks as they come out as new or improved hams. What a neat experience to upgrade your license and then celebrate by going off in search of a rig to make use of those new privileges!

If you plan to take a test at a hamfest VE session, remember to bring two forms of ID (at least one with a picture) and enough money to cover the current testing fees. Plan to get there early because these testing sessions can get a bit crowded throughout the day. Some operations will even take your name and give you a time to come back later in the day for the test in order to space the crowd out.

Now let's say you show up at a hamfest and VE testing is offered but you didn't plan to take a test. Meaning, you didn't necessarily study up for that next upgrade. If you have some free time and a few dollars, why not sit for the next test anyway? You may surprise yourself and pass. I've known more than a few folks who did just this. Further, sitting for the test even if you aren't ready is likely to give you a leg up on future preparation that far exceeds the small VE service fee that goes with taking the test.

❖ Rare Parts Store

If you are a dedicated home brewer, tinkerer, builder, etc., hamfests have become more important than ever. This is because many electronic components are becoming hard to come by. The revolutionary move to surface mount components has made many popular "through hole" semiconductors, capacitors, resistors and inductors as hard to come by as older vacuum tubes.

For example, the venerable NE-602 Double Balanced Mixer/Oscillator chip is

now only produced by Phillips in an SMT package. Its heavier duty "swap out" SA-612 is also out of production in all but a surface mount package. This little gem is at the heart of better than half of the practical receiver designs for ham radio in the last 20 years! Having done quite a job on my knees rooting through boxes under hamfest tables searching for tubes, I shudder to think of the same thing happening with once common ICs. Just as with tubes before them, hamfests will likely be the only place to find such items long after the commercial companies drop them from their catalogs.

For good or ill…hamfests have also by and large become computerfests. Often the amount of used and surplus computer gear far outweighs the radio stuff. I once walked through a hamfest with a friend who was in the market for a personal computer. He was able to pull together a state of the art system for less than half what a commercial vendor would charge. A case here, a disk drive there, a motherboard over on that table, some memory two tables back, and where did I see that nice monitor? You get the picture? If you know how to cobble the hardware together (or know someone who does) you can computerize your hamshack for very few shekels.

Now this is just fine if you have need of computer gear, and as I've just pointed out, you can find some great deals, too. However, I tend to like my ham radio experience "neat" so I wouldn't miss the computer guys if they didn't show up.(Then again, remind me someday to tell you how you can build a small transmitter completely out of parts scrounged from an old "Hercules" video card.)

❖ Entertainment or Education

It's not as common as it once was, but some hamfests still have some fun events. I'm not just talking about the fifty-fifty here. When was the last time you had a chance to participate in a QLF contest? For those uninitiated to that particular "Q" signal, it means "Sent with your left foot." Originally this was used to indicate a particularly bad fist on the air. Somewhere along the line somebody had the idea to turn it into a bit of hamfest fun. If your local show happens to have a QLF contest, give it a try. It's hilarious.

If your local hamfest has any forums or presentations on the schedule, you may want to take note and show up to a few. Often, these speakers represent some of the best people in the ham radio world, at least on the subject area they happen to be covering. Hamfest forums are great places to learn about a new mode you may not yet have tried. I always look for the presentations on subjects I am less familiar with and come away with a whole head full of new information and ideas. For example, a few years back a sat in on a forum about QRP operation and became hopelessly hooked on low power operation ever since.

❖ Hamfest Strategy

Hamfests have gone through a bit of a metamorphosis, at least here in the northeastern part of the country. They tend to be somewhat smaller affairs and they tend to start closing down in the early afternoon. Gone are the all day gatherings where a waning sun brought better prices as folks didn't want to lug gear home after a hard day at the table. Hamfests have become quick surgical maneuvers as opposed to prolonged campaigns. This is not necessarily a bad thing, but it does point to the importance of good planning and preparation to make the most of the hamfest experience.

I always make a list of parts I am particularly interested in for current projects. I also include those harder to find parts such as the NE-602 mentioned above and a short list of RF transistors. I also keep an eye out for 6146B tubes, as these "sweep" tubes are fairly common items used in restoring older transmitters. If I am seeking a particular item such as a transceiver or a piece of test gear, I make note of the prices I've seen posted for similar gear in magazines and on the Internet. I also make note of the most I would be willing to pay for the item.

I then make a firm promise to myself to stick to my guns. I've seen too many folks overpay for an item in the high spirits that a hamfest can engender. Be prepared to pass something by if the price is too high. Maybe later in the day you can get things down to a more reasonable place. If not, there's always the next hamfest.

While the above preparation is designed to cut down on impulse buying, always keep a few dollars aside for those odds and ends that show up at hamfests that you just don't ever seem to be able to find anywhere else. For example, antenna insulators or "real" ladder line. Hamfests are good places to find connectors and "tweenies" that are a bit different from those that show up at your local electronics store.

But all of this curmudgeonly stuff aside, the main reason I go to hamfests is to hang out with fellow hams. I've gone to more than a few hamfests in my time where I spent no more money than the admission fee and still had a ball. Hamfests are great places for "eyeball" QSOs with folks you may have only met previously on the air. It's an opportunity to swap ideas with a large group of like minded folks. I always come away with a bit more knowledge than I showed up with. But most importantly hamfests are fun. I'll meet you by the snack bar.

NOTICE: It is unlawful to buy cellular-capable scanners in the United States made after 1993, or modified for cellular coverage, unless you are an authorized government agency, cellular service provider, or engineering/service company engaged in cellular technology.

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Some Interesting Radio Books

Since my last book reviews in January, some new volumes of interest have crossed my desk and there are still a few remaining from the original batch. So it's time to open up the bookbag one more time. Next time, we'll continue our restoration work on the National SW-54.

❖ New Lindsay Books

The January "leftovers" were two of the four Lindsay publications I had received at that time. The Lindsay firm reprints unusual, interesting, and sometimes bizarre technical books from ages past. They offer a good selection of radio-related books. Write for a free catalogue (Lindsay Publications, Inc., Box 538, Bradley, IL 60915), or request one on line at ***http://www.lindsybks.com***; it makes entertaining reading!

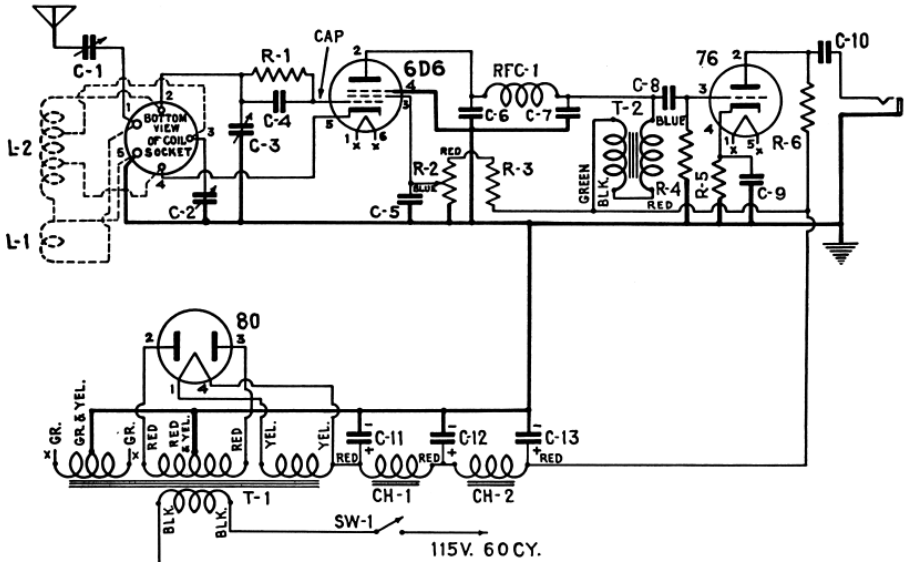
Reviewed in January were Lindsay's ***Crystal Receiving Sets and How to Make Them*** and ***The Impoverished Radio Experimenter–Volume I.*** To be covered now are two volumes of material originally published by Thordarson Electric (the transformer manufacturing company) of Chicago. Order either of them directly from Lindsay Publications at the snail mail or on-line addresses given. Include a check or MO for your total order (plus 6-1/4% sales tax for Illinois residents and $1.25 shipping for one book or $1.95 for both).

Amateur Radio–A Beginner's Guide by J. Douglas Fortune. Originally published in 1940. 155 pages, 5-1/2" X 8-1/2", soft cover.

This little book was targeted at radio beginners with the aim of enticing them into the ham radio hobby so Thordarson could sell them parts. I wish I had come across this one as a boy when I first became interested in becoming a radio amateur! Practical circuits and construction information for the required equipment alternate with careful and methodical explanations of each circuit function.

The first item to be built is a breadboard-style code practice oscillator. Once he or she has a working knowledge of the code, the beginning ham needs a good receiver to get on-the-air receiving practice. So, construction details and theory for a good, simple regenerative receiver follow next.

Construction of the transmitter is done in stages so that the builder can obtain experience with rigs of progressively more complicated design. First is a simple one-tube crystal oscillator, then on to a two-tube rig, then to a three-tube one. Each transmitter incorporates the parts of the previous one, and the first two units are built breadboard style for easy assembly and later disassembly. The final project is a modulator designed to convert the 3-stage transmitter into a phone rig.



Schematic of the 2-tube regen set from the Fortune book. Might make an interesting construction project for this column some day!

Cover of Stein's latest price guide evokes all the nostalgia of the early days of radio.

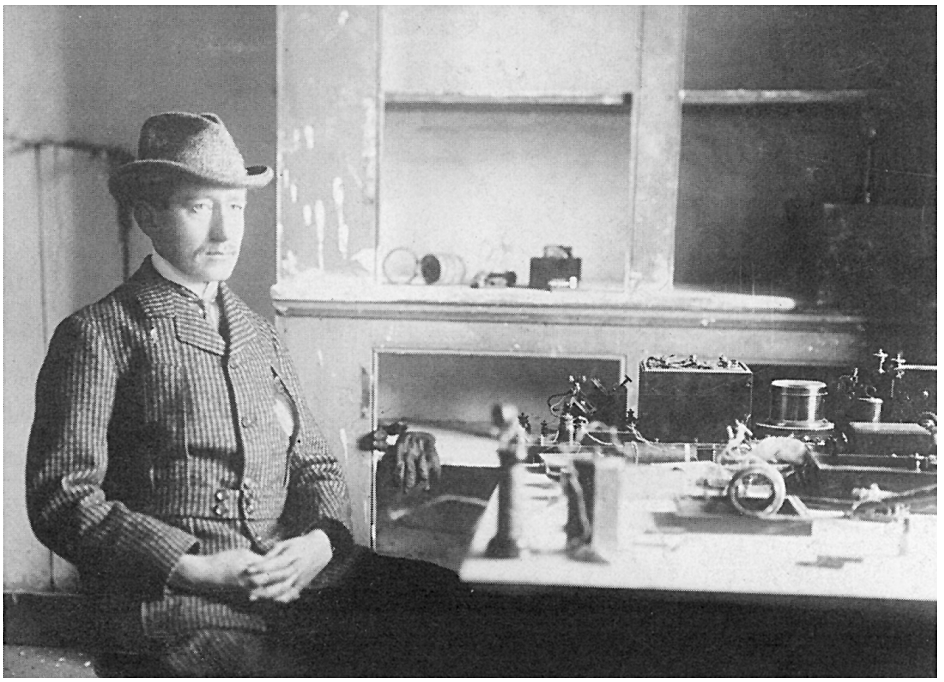
The book is really a fun and informative read, and of great value to those of us interested in building replicas of vintage ham gear.

Thordarson Transformer Manual was originally published in the 1930s**.** About 144 pages**,** 8-1/2" X 11", soft cover. Price, $11.95.

This is actually a collection of six different references and manuals from the Thordarson Co.: 346A Sound Amplifier Manual (1934); 342A Serviceman's Guide (1935); 342B Radio Servicing Guide (1936); 400 complete transformer catalogue and 500 TruFidelity Transformer catalogue. The latter two are undated, but 1930s vintage.

The Sound Amplifier Manual reviews virtually every audio circuit in use at the time; the Serviceman's Guide presents data and simple home-built tools to assist a beginning radio serviceman; the Radio Servicing Guide is a collection of servicing tips and tricks that are more advanced than those given in the Serviceman's Guide; the two catalogues provide a complete picture of the Thordarson line of the era.

The sound manual is quite a worth-while review of, and reference to, classic amplifying circuits. The two servicing publications make fun and nostalgic reads, and do contain nuggets of practical information useful to the radio restorer of today. The catalogues are invaluable



Moments after receiving the famous Atlantic-hopping "S," Marconi appears unaccountably nonplused. (From Marconi's Atlantic Leap)

references for identifying old Thordarson units found at swap meets. And the receiver replacement transformer section of the "complete catalogue" will give you the actual specs of the unit you need to replace a burned-out transformer in any size set of the era.

❖ For Those Interested in the Sociological Side of Radio

Fireside Politics: Radio and Political Culture in the United States: 1920-1940 by Douglas B. Craig. Published 2000 by Johns Hopkins Press, Baltimore, MD, ISBN 0-8018-6439-9. 362 pages, 6-1/4" X 9-1/4", hard cover. Price $45.00.

This book is not written for us hobbyists, but rather for scholars, so its style is more informative than engaging. However, many of us who are interested in old radio hardware are also interested in the profound sociological impact radio broadcasting had on American life from its inception in the twenties until it was replaced by television after World War II. In this new book, author Craig focuses specifically on the impact of the developing new medium on politics.

Craig discusses the evolution of radio into a regulated industry. He shows how the two major parties used the new medium in their national contests between 1924 and 1940 and explains how radio was influenced by prevailing national notions of citizenship and good taste. In closing, he compares the American use of radio in politics compared with that in Australia, Britain and Canada. The author draws from many authoritative sources, including NBC manuscript collections, documents from the government and the Democratic and Republican parties, broadcaster's memoirs, the contemporary press, and other contemporary writings.

❖ New Addition to the Stein "Price Guide" Series

The Complete Price Guide to Antique Radios: Sears Silvertone Catalogs 1930-1942 by Mark V. Stein. Published 2001 by Radiomania Books, 2109 Carterdale Rd., Baltimore, MD 21209, ISBN 0-9647953-4-5. 256 pages, 8-1/2" X 11", soft cover. Price $34.95 at retail sources or if ordered direct from the publisher (postpaid). Save two dollars if you order via publisher's web site ***http://www.radiomania.com***

This latest addition to Stein's "Complete Price guide" series is as much a nostalgia piece as it is a reference book. Within its covers is reproduced every piece of radio product advertising from every Sears Catalogue issued from 1930 through the end of civilian production in 1941/42. The author's efforts in obtaining the complete collection of catalogues, the cooperation of Sears, and access to the Sears archives are certainly to be commended.

Silvertone (the Sears radio brand name) may not be every collector's favorite marque, but the Silvertone radios reflected the general appearance and styles of most other manufacturers of the period. To leaf through the pages of this wonderful collection is to follow the evolution of receivers and their accessories during the golden age of radio.

The original prices of the radios, of course, are shown in the original advertising layouts. A very useful table at the back of the book lists all of the sets by model number, giving the date of introduction, manufacturer (if known), cabinet style and material, power supply, number of tubes and bands, and an estimate of current value. A second table shows how to find and interpret the manufacturer's source code found as part of the chassis number on the set's i.d. label.

This book is highly recommended to any radio collector or radio history enthusiast!

❖ Homage to Marconi

Marconi's Atlantic Leap by Gordon Bussey. Published 2000 by Marconi Communications, New Century Park, Coventry, CV3 1HJ, England, ISBN 0 95389 670 6. 96 pages, 7" X 10", hard cover. Price in US, $10.95.

Published by the Marconi firm itself, this book marks the centenary of the first radio signal to be transmitted across the Atlantic and tells the story of that event. It is lavishly illustrated with photos and graphics, some rarely seen, taken from the company's archives. The story of the feat begins with Marconi's vision for it and moves on to the building of the transmitting station at Poldhu Cove on the Cornish coast of England. Then we voyage with Marconi aboard the S.S. *Sardinian* to St. John's, Newfoundland, and watch him set up his receiving apparatus at "Signal Hill."

The seminal event took place on December 12, 1901, when the three dots of the Morse letter "S" were picked up by the 510-foot kite-raised antenna and clearly heard in the receivers. A photo taken just after reception of the signal shows Marconi's unaccountably deadpan expression.

The final chapters deal with the public reaction to the event, Marconi's further tests of his system by receiving signals from Poldhu aboard the *SS Philadelphia* traveling from Southampton to New York, and the establishment, in 1903, of two-way communications between England and the United States through an exchange of messages between Theodore Roosevelt and King Edward VII.

See you next month, when we'll get back to the SW-54.

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An Antenna for Low (and Higher) Frequencies

Over the last three months this column has presented a series of articles on antennas across the radio spectrum. Each of our next three columns will feature an antenna from the portion of spectrum covered by one of those columns.

This month let's consider an active antenna which should work well on the LF and VLF bands. I was able to test it only as low as 100 kHz, but, as it has no tuned circuits, it should work well into the VLF also. A nice perk from this antenna is that it not only works on these low bands; it also performs above LF up through the MF and HF band. I did not test it on the VHF or higher bands.

❖ Active Antennas

Active antennas are actually composed of both a short antenna element and an amplifier. The antenna element itself – usually a telescoping whip or short piece of wire – is not long enough to be a satisfactory receiving antenna. However, it is sufficient to act as a probe which couples to passing radio waves. The small amount of charge picked up by this probe is passed on to the amplifier where signals, which would be too weak for good reception when received on the probe alone, are often made sufficiently strong for good reception. The amplifier should be quiet enough that it contributes no significant noise to the received signal. An active antenna with an antenna element only a very few feet long can often produce signal strength comparable to an outside longwire.

❖ There Ain't No Free Lunch

Although active antennas are very useful in many receiving installations, they do have their limitations. For instance they are quite susceptible to intermodulation distortion (intermod or IMD). If there are strong signals in the location where they are utilized then most likely there will be spurious signals at various frequencies due to intermod. Usually this intermod can be reduced or eliminated by reducing the strength of all signals presented to the amplifier by the probe. This can be done by using a resistive attenuator at the antenna as in fig. 1, or by shortening the antenna element. Better, but requiring more time and expense to build, is to reject the offending signals using tuned circuits.

Strong signals can also overload the amplifier and lower its sensitivity. But, even with their limitations, active antennas frequently provide support for much pleasurable monitoring. They are especially useful where an outside antenna is not possible, and are a quick and easy portable antenna for traveling.

❖ Let's Make One

Fig. 1 shows the diagram of the active antenna featured this month. All of the parts are available at Radio Shack or other electronic parts stores. There's nothing critical about the wiring; just make the connections strong, and keep all wires well separated so they can't touch one another unintentionally. Holding the transistor leads with a pair of pliers as you solder the tip of the lead in place helps prevent overheating the transistor.

I made this antenna on a piece of soft, dry wood about 3 in. by 6 in. I drew the schematic diagram on the wood, and drove brass nails into the wood at points where components would join. Coat the nail tops with solder, and solder the leads to the nailheads to complete the wiring. You may have other ideas on how you want to construct your antenna. Solderless breadboards and universal component boards with enough pre-drilled holes to accommodate most small projects are available at various electronic supply houses.

Perhaps this is your first time building a piece of electronic apparatus. If fig. 1 looks too complex, you could try the simpler, one-transistor model described in this column in July 1990. Reprints are available from *Monitoring Times* for $3 plus an SASE.

❖ Using the Active Antenna:

Using the antenna is basically quite simple. Connect it, turn it on, set R1 for maximum gain, and tune the bands for signals. Two to three feet of wire, or a telescoping antenna should be long enough for the antenna element. Sometimes less than a foot is enough. In electrically quiet areas longer elements may be worthwhile, especially when there are no transmitting stations in your vicinity to cause IMD.

Learn to recognize IMD so that you won't be fooled into believing that you have a real station when it is actually just this "self-interference" generated by the amplifier of the active antenna. IMD often sounds somewhat garbled,

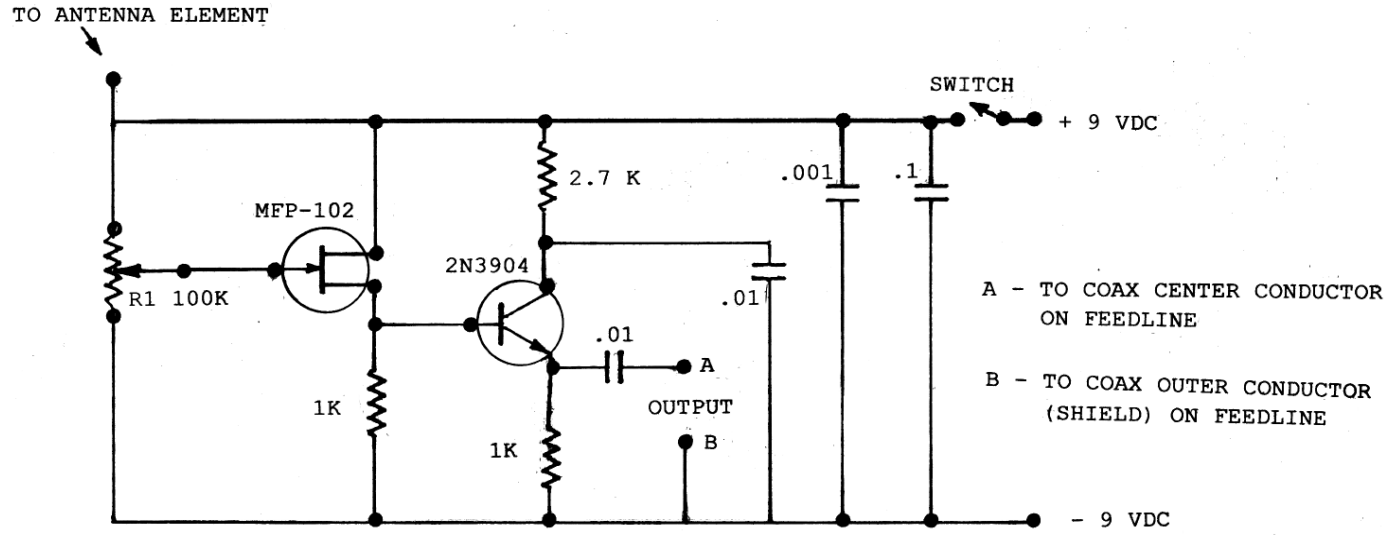

Fig. 1. Schematic diagram for the active antenna discussed in the text.

This Month's Interesting Antenna-Related Web site:

Check out the ARAD Low-Frequency web page at:
http://www.amrad.org/projects/lf/
And here's a source for an LF handbook which I hadn't yet seen:
http://www.lwca.org/index.htm
Send in your suggestions for inclusion here as an interesting antenna-related web site to: <clemsmall@hotmail.com>.

or sounds like multiple stations transmitting simultaneously on the same frequency. When you suspect that what you hear is IMD, try slowly reducing the input-signal level (R1); at some point IMD tends to disappear more suddenly than real stations do. Real stations tend to fade out more gradually with gradually reduced input. Shortening the antenna element can also reduce IMD.

❖ If You'd Like More Info

Possibly the best source of hobbyist information on LF is *The Low and Medium Frequency Radio Scrap Book*, by Ken Cornell, W2IMB. It doesn't have much on antennas, but it has some. Some of the publications of the National Radio Club (Ken Chatterton, National Radio Club Publications, P.O. Box 164 - Dept W, Mannsville NY 13661 or ***http://www.nrcdxas.org/catalog/***), particularly the things on Beverage antennas, can be used on LF.

❖ You Might be the Winner, If you Hurry!

Last call for the antenna contest! Do you know of an antenna that is quite different in appearance or function from the ordinary antennas we see everyday in the cities and countryside? One that is highly unusual or even weird? If you do, send me a photo or sketch of it, any information you have on the antenna, and your reasons for choosing this antenna for entry in our contest. We'll publish the entry I judge most appropriate in this column, and award an antenna book to the winner!

RADIO RIDDLES

Last Month:

You were asked: "Marconi is generally considered to be the inventor of the wireless communication which we now call "radio." But successful wireless communication systems other than radio were developed prior to Marconi's. What electrical phenomena were the basis of these various earlier wireless systems?"

Well, wireless systems utilizing induction between large loops of wire were developed and even put to practical uses such as giving messages to passing railroad trains without connecting wires. Wireless systems utilizing conduction were also successfully demonstrated: By connecting to two widely-separated earth connections on one river bank, messages could be exchanged with persons using a similar setup on the opposite bank. And a dentist named Loomis communicated frequently and reliably without wires using the electrical gradient of the atmosphere as power. He used kites to hold his "antennas" aloft. Loomis's system felt that his system functioned by conduction between the wire mesh attached to each kite, through the "electrified" atmosphere, with ground connections back through the wire kite strings completing the circuit.

Speaking of systems prior to Marconi's, Dolbear demonstrated actual radio-wave communication prior to Marconi's work. And the great Nicola Tesla had systems working prior to Marconi's such that, many years too late to do Tesla any good, he was awarded the basic patents on radio communications by courts in the United States.

This Month:

There's an old saying about antennas that goes "the higher the better." Is that so? If so why? If not why not?

You'll find an answer for this month's riddle, another interesting, antenna-related web site, and much more, in next month's issue of *Monitoring Times*. 'Til then Peace, DX, and 73.

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Hey, Where Did the Plug Go?

If you have an old PC lying around, circa pre-1998, take a look at the AC power cord connection on the back of the case. You'll probably find a second power-type connector originated by the IBM PC designers in the 1980s. This connector supplied AC power only when the computer was turned on. This second plug was a great idea and very useful. Using a short, special cable the user could use this to supply AC power to a monitor. Connecting a power strip to this cable allowed automatic switching on, and off, of radios, decoders, amplifiers and other accessories. This is a very convenient and energy saving feature for any monitoring shack.

Now check the back of your new HP, Compaq or E-Machine for this useful plug. GONE! Sacrificed as a cost cutting effort on most ATX machines, I really missed this feature, until now.

❖ @ Power Strip

My mailbox is constantly clogged with catalogs from computer and radio companies, to the chagrin of our Postmaster, Maryann. But one catalog that always gets my immediate attention is from CyberGuys. This company seems to find some of the most innovative and useful computer products and accessories.

This time they had a product simply named @ Power, that replaces the lost AC control function. The @ Power looks like a colorful AC outlet strip, with surge protection and with one "special" outlet, into which you plug your computer. You then can plug up to five computer/radio accessories into the additional outlets. When you turn on your computer the @ Power will sense it and automatically turn on the other outlets. Shut off the computer and the accessories will follow with a six-second delay. The maximum rating of the strip is 1500 watts, which takes care of most applications.

❖ Feel the @ Power, Luke

The transparent housing has three lights (LEDs) which indicate useful information. The first shows that the strip is operating under surge protection. The second tells the user that it is connected to a correctly grounded outlet. The third illuminates when the five auto-controlled outlets are turned on.

I tried @ Power with three desktop computers, an HP, E-Machine and a homemade Pentium II, and it worked perfectly. However, as expected, the sensing circuit has a minimum "on" current value. A laptop, powered by a wall wart, switched-mode power adapter, would not turn on the auto-outlets.

The @ Power also provides surge protection for phone/modems and a wall hugging flat plug on its six foot power cable. @ Power is available from Cyberguys for $23.99. One of the sockets is positioned with lots of space around it so it can accommodate one wall wart power adapter without blocking the other outlets.

❖ Simple Idea – Great Help

Talking about wall warts, how many times have you found that plugging one wall wart power adapter into a power strip denies you the use of the two sockets on either side of it? The Power Strip Liberator is a simple short cable, which looks like a short computer power cord and works with any US power strip. One end is terminated in a standard three-pronged standard USA AC plug. Therefore, this plugs into a power strip outlet without blocking adjacent outlets. A wall wart can now be plugged into the other end and left "hanging" to the side of the strip. All the strip's outlets can now be used. If you have one Liberator for each wall wart, all the strip's outlets can be populated by wall warts. At $1.79 each, the Liberator is very simple but very helpful if you have lots of wall wart power adapters.

❖ Harold ... Get Off the Internet!

If you have only phone line in your house, and you use it for both telephone and Internet, you will eventually hear the phrase my friend Harold hears from his wife a few times a day. No doubt, she is worried about missing an important call… The obvious, but costly, answer is a second phone line. But that solution means installation cost and additional monthly costs.

Now there is another answer, Catch-A-Call. See Figure 1. This product requires that your telephone line have the call waiting feature activated. While you surf the Web, Catch-A-Call is "listening" for the call waiting tones. Once detected, an internal ringer alerts you to an incoming call. If you choose to answer the call, it places your Internet connection on hold by flashing the line.

Figure 1 - Connectors on Catch-A-Call: Notice the Small Size of the Unit

Installation is very simple. This small box is connected to the phone line. Then your computer modem, telephone and fax (if you have one) are connected to the box. A small power adapter (wall wart) powers the Catch-A-Call. Since no software is required it can be used with any computer on any line with call waiting.

❖ What Price Freedom?

In use I found it to operate pretty much as advertised. It seemed that the quality of the phone line (noisy or clean) and the speed of the computer being used had some effect on its operation. The instruction sheet suggests adding a string of variables to the modem setup to fine-tune the control of incoming calls. I tried it with some success, but felt it then came close to violating its "no software" claim.

Overall, for $44.95 at Cyberguys, Catch-A-Call is a great product and could save you money, while promoting domestic tranquility in your (and Harold's) relationship.

These three products, and many more, are available from Cyberguys at ***http://www.cyberguys.com*** or 1-800-892-1010. Tell them John C from *Monitoring Times* sent you and ask to be put on their catalog mailing list free of charge.

❖ All Sing & Dancing Modem

I must confess, I have been playing with a product called "Total Office," by Olitec, for many months. See Figure 2. This external modem-sized product does it all for a small business. It does so much it even comes with a wireless remote control! Imagine that.

Let's just list some of the powerful office functions that this little box can perform: 56K V.90 Modem, full duplex speaker phone, voice mail, send/receive faxes, send/receive email and display/storage of caller ID information.

Total Office has all these features when attached via the serial port to a computer. It has modest computer requirements working with a 486 or better CPU, 4 MB of RAM, less than 20 MB of hard drive space and MS Windows 3.1, 95 or 98 operating system.

❖ Going Solo

Figure 2 - The Total Office by Olitec

This line-up of functions is pretty impressive. But Total Office performs many of these things even when it is NOT connected to a PC, or with the PC off. A Smart Media Card module, included, stores up to 20 minutes of voice mail and 100 pages of fax messages.

With its one line LCD dot matrix LCD, Total Office can display most basic instructions and responses without the need of a computer.

The included FotoWin software is used for FAX communicates and does a good job. A full version of Netscape Pro is also included for Internet communication.

The two remote forwarding/alerting features I found particularly unique and useful. Total Office will automatically call your cell phone when it receives voice, email or fax messages. In business, having this instant communication feature can mean the difference between success and failure.

Total Office will also automatically forward faxes to your hotel or remote location when you are on the road.

First Impressions

As I said, I've been using this product for several months and I'm very impressed with all the features that have been crammed into Total Office. Since it can operate in a standalone mode, you can set up office anywhere there is a telephone line and AC power when travelling.

However, I found the setup effort and operational command structure of Total Office to be complex, a bit confusing, and requiring too much effort for all but the serious user. That said, I still think the product is very innovative and comes close to a "company-in-a-box."

If you have a small business, or if you are one person trying to give the impression of a larger operation, you must check out Total Office's features, price and availability at ***http://www.olitec.com***.

What's Coming?

How about a receiver for a whole new "band"? A program to get your computer clock aligned with an atomic time source? And lots more monitoring programs waiting for us. Let me get started on all this good stuff. Till next time.

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http://www.megsinet.com/parnass

Alinco DJ-X2000T Scanner

The Alinco DJ-X2000T is a handheld, wide coverage receiver made in Japan for the US market. It is a top tier model founded upon the DJ-X10T (November 1998 *MT*). The two models look alike, but the DJ-X2000T is supplied with a rapid charger and beefed up with more channels, more step sizes, a CTCSS decoder/finder, voice recorder, and a "Flash Tune" frequency counter which can tune the receiver.

Multimode frequency coverage extends from 0.1 to almost 2150 MHz (minus a few gaps) in 23 selectable step sizes and a user adjustable step size from 0.05 to 500 kHz (see Measurements). This US version skips the cell phone band inputs and outputs, but we discovered an undocumented gap at 1432.6 - 1504 MHz, too. A single knob atop the radio clicks when rotated and serves as a VFO knob, channel selector, menu navigation control, volume, and squelch control.

Our DJ-X2000T (serial no. T000530) came furnished with an EBP-37N 4.8 V, 700 mAH NiCd pack and a 1 hour rapid charging stand, a step up from the 11 hour charger supplied with the DJ-X10T. Interesting options for both the DJ-X2000T and DJ-X10T include a soft carrying case, an EDC-36 automobile DC power cord, an EPB-34N 1200 mAH battery pack, and a mobile bracket.

When used with the proper (optional) cables, the one can be cloned to another or connected to a personal computer. The instruction manual does not document the computer interface commands; however, we expect free software will be available at Alinco's web site ***http://www.alinco.com***.

The DJ-X2000T is loaded with firmware features and is complicated to use. The 88-page instruction manual is helpful, though adding a menu navigation diagram would improve it.

Memory

The DJ-X2000T supports two VFOs and 2000 channels in 50 banks of 40 channels each. Memory banks are cryptically designated A0-A9, B0-B9, ..., E0-E9.

Each memory channel can be programmed with the frequency, an 8 character label, attenuator (off, low, high), CTCSS code, a skip (lockout) flag, and mode (WFM, NFM, AM, USB, LSB, CW, AUTO).

Scanning and Searching

The DJ-X2000T can scan more than one bank at a time. Another type of scan, termed a PMR scan, permits you to define 10 scan lists of up to 20 channels each, regardless of bank. Think of the DJ-X2000T as having two ways to scan memory channels. You can program memory banks for different cities, and set up one PMR scan list to scan the police channels in all banks and a second PMR list to scan all the fire channels.

To measure scan speed, we locked out 25 of the 40 memory channels in a bank and programmed the remaining 15 with an assortment of VHF and UHF frequencies, CTCSS settings, and AM/NFM modes. Our DJ-X2000T plods slowly through the bank at only 3 channels per second in scan mode. It searches at about 29 steps/second, which is 8 steps faster than the AOR AR-8200 we tested (s/n 550004).

The global rescan delay is adjustable between 1 and 12 seconds, an improvement over the DJ-X10T's fixed 1 second delay.

The Auto Memory Write facility permits you to search between frequency limits and store up to 40 unique, active frequencies in any memory bank. This is a major improvement over the DJ-X10T which auto writes only in bank C9 and does not check for duplicate frequencies.

Both the DJ-X2000T and DJ-X10T support 20 search banks, designated P0-P9 and p0-p9, which you can program with frequency limits and labels. Search banks can be linked together, permitting you to search disjointed parts of the spectrum. You can also search between the frequencies in both VFOs. Up to 50 frequencies per search bank can be locked out using the Pass facility.

A priority feature lets you designate one channel to be checked for activity periodically (every 1 - 20 sec.) while scanning memory channels or searching, but chops up reception on non priority frequencies.

Other Features

The "Flash Tune" feature is amazing. Set the mode (e.g., AM, NFM, WFM), initiate the Flash Tune, and the DJ-X2000T sits quietly until it detects a strong signal (approx. -30 dBm, approx. 7100 uV) within the 50 - 1300 MHz range. At that point, the display shows the approximate signal frequency and lets you hear the action. You must set the mode (e.g., AM, NFM) ahead of time. We used it to find and monitor 470 MHz transmissions from someone using a walkie-talkie 25 feet away, though it didn't detect a low power 170 MHz wireless microphone at 5 feet.

Our DJ-X2000T's Flash Tune also finds portable cellular phone transmissions, but it plays no audio and displays 823 MHz because the US version is cellular disabled.

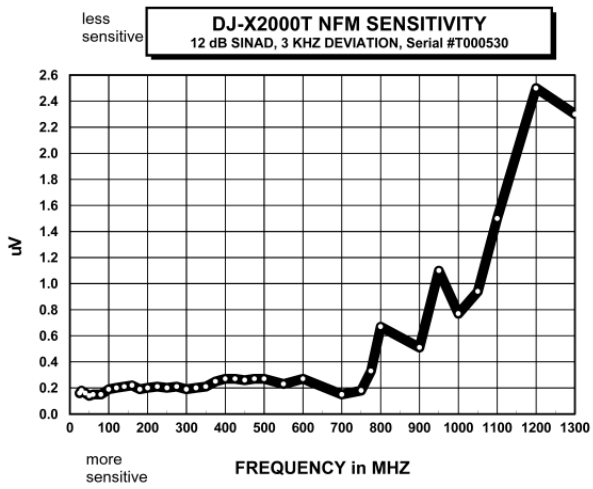
The DJ-X2000T contains other features which set it apart from simpler scanners:

1. a digital voltmeter which displays battery voltage
2. clock with on/off timer
3. a 160 second audio recorder
4. a built-in microphone which permits the radio to be used as a sort of hearing aid when fitted with an earphone
5. a two level attenuator
6. stereo WFM reception and stereo indicator lamp when using stereo headphones
7. a band scope which graphically portrays activity within a band of frequencies

Rugged Construction

Like the older DJ-X10T, the DJ-X2000T is ruggedly built. With its metal back and snap-on battery pack, the DJ-X2000T looks and feels like a 2 meter walkie talkie.

The single, multifunction knob is conical and difficult to grasp without your fingers slipping off. The squelch and volume are set by a pair of momentary contact rocker switches instead of simpler knobs, and we find this unhandy and time



consuming.

The Function, Search, Monitor, and Lamp keys are mounted under a black rubber boot on the side of the radio. The labels are not painted, making them difficult to read. The remaining keys are well labeled for daylight use and widely spaced. Key presses are confirmed by a selectable beep tone.

The dot matrix LCD screen features adjustable contrast via a keypad sequence. The display contains a 7 bar S-meter, and a separate green LED lights when the squelch is open – a nice touch. Both the display and numeric keypad are backlit in green when the Lamp key is pressed; however, the white key labels are difficult to see when lit.

❖ Performance

The stock antenna supplied with our DJ-X2000T looks like a 146/440 MHz base loaded rubber whip. Our Pryme RD-9 antenna receives better on VHF/UHF, but the Alinco antenna has the edge on shortwave and AM broadcast band signals.

Like the other handheld wide coverage receivers we tested, our DJ-X2000T overloads when connected to a full size, outdoor antenna. The low attenuation setting diminishes or eliminates the combination of pager and NOAA weather transmitter intermod on the VHF-high band, but does not eliminate intermod from AM broadcasters on short or medium wave frequencies.

The single AM bandwidth is rather broad for shortwave reception in a crowded band. VFO and limit searches stop 5 or 10 kHz off center frequency when hunting NFM signals.

The DJ-X2000T instruction manual does not specify the IF (intermediate frequency) scheme. Our tests reveal a first IF of 724.4 or 304.3 MHz, depending on the frequency to which the DJ-X2000T is tuned. Other IFs include 45.04, 10.7, and 0.455 MHz.

The audio output is adequate, though not outstanding. A hiss noise is present when listening to our DJ-X2000T, even on the strongest signals. There are two audio fidelity settings available via menu choices. Our radio emits a 110-millisecond-long noise burst at the end of each transmission, regardless of the carrier or CTCSS squelch settings.

Our DJ-X2000T draws less battery current than the DJ-X10T we tested, and that's good news.

❖ Overall

The DJ-X2000T satisfies the need for a wide coverage, portable receiver. The Flash Tune feature is outstanding. The memory bank size is very good and there are more channels than you will probably ever need. The rapid charger is a godsend. The DJ-X2000T's main drawbacks are its slow scan speed and high price.

Measurements

DJ-X2000T Portable Scanner
S/N T000530

Alinco, Inc.
438 Amapola Ave, Suite 130
Torrance, CA 90501-6201
List price: $770, but sells around $500

Frequency coverage (MHz):
0.1 - 2149.99995 MHz,
except 824 - 850, 869 - 895,
and 1432.6 - 1504 MHz

Step sizes (kHz):
0.05, 0.1, 0.2, 0.5,1, 2, 5, 6.25, 8.33, 9, 10, 12.5, 15, 20, 25, 30, 50, 100, 125, 150, 200, 250, 500, and user programmable sizes between 0.05 and 499.95 kHz

Modes:
AM, WFM, NFM, USB, LSB, CW

Intermediate frequencies (MHz):
724.4 / 304.3, 45.04, 10.7, 0.455

FM modulation acceptance: 8.4 kHz

Squelch tail length (1uV @ 155 MHz): 110 ms.

Practical memory scan speed: 3 channels/sec.
Search speed: 29 steps/sec.

Current consumption at 4.8 VDC:
off - 391 uA
manual - 108 mA
scan - 108 mA
full volume - 256 mA
lamp - 38 mA additional

Low battery warning at 4.48 VDC or less.
Shutdown at 3.94 VDC or less.

DJ-X2000T on HF plus Your Letters

DJ-X2000T Shortwave Reception

by Bob Grove

(See Bob Parnass' review of this model and its VHF/UHF performance on the preceding page.)

When reviewing a small, hand-held radio receiver, it must be remembered that these are intended for their portable convenience. While they might be packed to the gills with incredible functions, there is no assurance that these functions will perform as well as similar functions in larger, pricier radios.

It is quite probable that the following comments can be applied to virtually any hand-held radio receiver – scanner or shortwave portable – so it is intentionally generic, reflecting our findings over years of field and lab tests. The DJ-X2000T is no exception.

While the small speaker certainly provides intelligible sound, its frequency limits, coupled with the small size of its enclosure, severely limit the "presence" of the sound. In other words, a "woofer" it ain't!

Listeners will find voice reproduction quite acceptable, although high volume levels begin to tax the flexible range of the speaker cone, causing some distortion at its upper limit. An earphone or external speaker is usually the answer here.

The AM-mode selectivity of a hand-held scanner is determined by ceramic filters chosen for VHF/UHF aircraft reception. And while aircraft channels are normally spaced no closer than 25 kHz (now narrowing to 8.33 kHz in Europe), the 5 kHz spacing of shortwave broadcasters requires sharper filtering than what is provided.

As a result of the wide filters, weaker distant (DX) stations are often clobbered by adjacent-frequency powerhouses. For the same reason, equal-strength adjacent-frequency stations may share mutual interference, resulting in a combination of "cross talk," befuddling any effort to hear just one of the stations.

Because tiny radios are always equipped with relatively tiny antennas, signal handling capability of these sensitive radios (dynamic range) is limited. When such a radio is coupled to an efficient external antenna, the circuitry is commonly overloaded by strong signal presence, resulting in intermodulation (combinations of signals heard at multiple locations across the spectrum), and images (one or two mirrored signals heard on frequencies where they aren't actually transmitting).

Even though the manufacturer's printed specifications of the selectivity filters used in his radio may look good, one spec is virtually always missing: ultimate attenuation. This refers to the filter's ability to separate very strong signals.

As a result of all the inherent cost compromises understandably built into price-competitive portable radios, when you connect an external antenna, the spectrum is often loaded with a permanent din of background signals heard when no actual on-frequency signals are present. The DJ-X2000T is not alone; it is virtually universal among portable radio receivers.

The shortwave overload symptoms are worse at night when the big boomers from Europe begin to fill the lower HF spectrum. Using the attenuator often helps remove the background din, but it makes all signals weaker, including the elusive – often weaker – ones that you might wish to hear.

External preselectors are often helpful, but good ones are hard to find, add expense, and are bigger than the radio itself.

It's probably better to accept the fact that if you want teensy portability, wide frequency coverage, and a large number of functions, the tradeoff is compromised single-signal reception.

"Quick Toggle" of Front End Filters on NRD-545

David Zantow N9EWO
http://members.fortunecity.com/swradios

Here is a function I discovered that was not indicated in *my* '545 owner's manual. This was on my ***Japan Radio Co.*** NRD-545 with a serial number a bit over RG 06400 and may or may not exist on older or later versions.

On #24 of the "User Setup Functions" we have a selection for front end filtering. This allows you to bypass the front end filters for perhaps a bit more sensitivity in cases where you need every bit to pull a signal out of the mud. Normally front end filters can add a few dB of signal loss. But of course you should NOT leave this in the bypassed mode for normal listening. The NRD-525s and 535s also have the same "pass" switch.

But during "scan" (scanning of the memories) function, leaving these filters on as it chuffs over the memory channels...well, it makes the filter relays chatter like a old auto on its last legs.

So to switch off the front end filters you have to drop to the "user setup function" mode. Select it down to # 24, and then switch it to 0. Of course after you are done with your scanning, you have to do this chore all over again.

Well, here is the "quick toggle" that I discovered. Press the "FUNC" (function) key then the "ATT" key. You will hear one beep (not the usual error beeps). You will see NO indication on the display anywhere, even if you drop into the user setup mode and peek at #24 after you do this, it will not show it correctly. To toggle it back, just repeat "FUNC" and "ATT" again. You will not be activating the attenuator doing this.

If you turn off the set and turn it back on again, it will default to whatever you have set in #24. This quick toggle operation will not change this setting in any way.

(I miss the "pass" indication on the display with the NRD-545. The NRD-525 and 535 had this, of course.)

Am I an Icom R3 Idiot?

Tom Morganelli

I'd like to say that I've been getting *Monitoring Times* for its whole run (I got one of those complimentary copies advertised in *CQ* and have been getting the magazine since.)

I bought an IC-R3 in November and quickly took it out and tried to figure out how to use it. Here it is March and, although I don't have the time to put into these things like when I was younger, I still don't know how to make the thing scan.

Entering frequencies into the memory is very difficult. Most of the time if you dwell on any of the buttons too long you wind up poring over the manual trying to see just what the heck it's doing now. It has a cute little TV but the button system is way too complicated. That 'joy stick' feature is no joy. Why didn't they just put a few more buttons and/or knobs on the darn thing?

I've had programmable scanners for 20 years and now I've just bought the latest available and it's getting about as much use as my old BC-300. Maybe I'm getting too old for this technology.

I'm going to keep the thing (it is a cute little TV for $500) But I think ICOM should get a little feedback because I bet I'm not alone in this. For all it does the ICOM IC-R3 should be rated at a high level of difficulty.

Anyway the whole point to my ramblings is to tell ICOM that some of their products are aimed at the videogame generation. Yeah, I bet they can come back to me and say I'm some kind of dummy, but at 52 that's not my life's track record.

Neither Bob Grove nor Bob Parnass could

disagree with Tom's experience. "I agree with Tom that the IC-R3 is a challenge to use," said Parnass. "Are we getting too old to learn these things? :-)"

Need to Upgrade?

Mario Filippi

The ad I placed in *Monitoring Times* for a Panasonic RF-2200 worked very well. I was able to purchase a unit for a reasonable price from a gentleman who was the original owner and who kept all the accessories for all these years. After a cleaning and some minor troubleshooting the unit works well. My satisfaction couldn't be better.

For at least four years I have been looking for one of these radios and your ad did the trick.

If you're not in a hurry to find what you want, the MT Stock Exchange at 25 cents per word is a good deal: Tom Hammett is another reader who found a mint-condition Satellit 700 a couple of years ago after he advertised for one in MT.

In a rush? Spread the word via the MT Chat Board (www.groveenterprises.com/wwwboard/wwwboard.html); Though you'll reach a smaller audience, it's free! – RB

A Little Nostalgia

Jerry Brookman KL7CMN, Kenai, Alaska

I thought you might find the accompanying advertisement interesting. I inherited a number of *Field and Stream* magazines between 1920 and 1927 when my Dad died last summer. (He was born in 1907, so he either started reading such magazines at an early age, or got them from his father.)

Considering that a dollar went a lot farther than it does today, the price ($269) of the radio was pretty steep! (The magazines themselves cost 25 cents each.)

Radio was pretty new back in those days, and I suppose it was roughly the equivalent, in terms of technology, as satellite TV, computers, etc. are today! Somehow, the thought of those two fishermen lugging that thing out into the wilderness, along with heavy batteries necessary to power it, makes it a pretty sure thing that they had to be really dedicated radio enthusiasts!

Keep up the good work. *Monitoring Times* is one of my most favorite publications, and I read quite a number of different ones, on different subjects.

MT REVIEW

Hamtronics LNK-WB Wideband Preamplifier

by Bob Grove

It's a universal myth that the best way to hear weak signals is by adding a preamplifier to the antenna line. Preamps almost invariably aggravate reception by increasing front-end-overload problems like intermodulation ("intermod"), recognized by the mixed sounds on several frequencies.

With scanners, intermod often includes the beeping garble of digital paging transmitters, or the voice sounds from two different communications transmissions. The interference frequently contains the music of a local FM broadcaster as well. On shortwave, a common malady resulting from over-amplification is a constant background din of sounds from a myriad broadcasters and strong utility signals.

Often, inexperienced hobbyists will be disappointed after adding a wideband preamp only to hear the background noise ("hiss") increase noticeably, another shortcoming of inappropriate additional gain. And wideband amplifiers have considerably higher noise figures than narrow-band amplifiers, somewhat akin to selecting a narrow-bandwidth filter to reduce wideband hiss on a receiver.

But there are situations in which a preamp can help: rural locations where all signals are low; UHF and microwave bands where distant signals such as satellites are weak; or on antennas ahead of a long, lossy feedline. Another common use for a wideband preamplifier is in a laboratory environment to boost weak signals adequately to be analyzed with test instruments.

If preamps were the ultimate cure-all, professional receiving installations would simply install a marginal antenna and toss a preamplifier in line, but they don't; they design the best antenna they possibly can, and if additional preamplification is necessary, they choose low-noise preamps with only moderate gain, and add plenty of filtering to block frequencies or bands which contribute to strong-signal overload.

Now that we've characterized the appropriate use of a preamp, let's take a look at a good, affordable, wideband preamplifier from a long-time player in the ham radio market, the ***Hamtronics LNK-WB***. Housed in an anodized aluminum case measuring 3-1/2"L x 1-1/2"W x 1-1/4"D, it is affixed with two female, chassis-mount BNC connectors, and a protruding, 24" length of wire to attach +12 to +15 VDC at 10 mA of current. The negative terminal is the metal case.

Inside the box is a single 2SC2369 low-noise, bipolar microwave transistor, a popular part number designed for just this application, and its supportive bias and isolation components. An "idiot" diode is in line to prevent accidental damage from reverse-polarity power connections – as I've done too often myself!

The preamp provides 10-20 dB gain from about 10-500 MHz, gradually decreasing to around 5 dB at 1000 MHz. It cannot be used for transmitting.

Our Test

The LNK-WB was connected between an outdoor log-periodic antenna and an ICOM R8500 receiver to measure received signals.

Without bandpass filtering to remove strong signals from FM broadcasters and paging transmitters, the LNK predictably generated high intermod products, characteristic of small-signal bipolar transistors. Hamtronics warns prospective customers of this on their web site. Bandpass filtering tamed the unit considerably, and its general performance matched the advertised specifications.

With consideration given to its limitations in a strong signal environment, we judge the LNK-WB to be a good value for general purpose, wideband, small-signal amplification. Hamtronics also offers preamplifiers from 24-470 MHz for narrow-band applications

The LNK-WB is available for $59 plus $7 shipping U.S. from Hamtronics, 65 Moul Rd., Hilton, NY 14468-9535. For information, call (716) 392-9430 or visit their web site at ***http://www.hamtronics.com***.

Yaesu VR-5000 Scan Fix

Yaesu has supplied the following replacement page to the VR-5000 manual correcting the procedure to be followed for doing a programmable memory scan.

Programmable (Band Limit) Memory Scan (PMS)

This feature, a more refined and useful form of VFO scanning, allows you to establish sub-band limits for scanning. This allows you to monitor only a portion of the wide frequency range of the VR-5000, instead of sweeping the entire spectrum from 100 kHz to 2.6 GHz.

Programmable Memory Scan utilizes a pair of frequencies to establish the upper and lower scanning limits within special memories. Here is the procedure for setting up limited band scanning:

Programming

1. Press the [F] key momentarily, then press the [PMS(PMS SET)] key to enable the storage of the frequency pair into a PMS memory.
2. The cursor will be pointing at the "PMS CH" menu option; press the [ENT(SET)] key.
3. If you want to program the frequency pair into the currently-selected PMS register (shown on the right edge of the display), proceed to the next step; if you wish to choose a different PMS register, press [ENT(SET)], then use the [q(t)/p(u)] keys to select a different memory register number. Then press [ENT(SET)] to move on to the next step.
4. Rotate the DIAL knob to set the cursor to the "PMS TAG" menu option.
5. Press the [ENT(SET)] key to enable the programming of the name tag to the PMS memory. To attach an alpha/numeric name tag to the PMS memory, program the alpha-numeric "label" using the DIAL knob and keypad, as described previously; if you don't want to label this frequency pair register, press the [ENT(SET)] key again.
6. When you have completed the creation of the label, press the [ENT(SET)] key.
7. Now it's time to set up the band limits. Rotate the DIAL knob to set the cursor to the "START F" menu option, then press the [ENT(SET)] key.
8. Set the VFO frequency to the Lower sub-band limit, then press the [ENT(SET)] key.If you programmed the frequency using the keypad, press the [ENT(SET)] key again.
9. Confirm that the cursor is on the "END F" menu, then press the [ENT(SET)] key.
10. Set the VFO frequency to the Upper sub-band limit, then press the [ENT(SET)] key.If you programmed the frequency using the keypad, press the [ENT(SET)] key again.
11. Rotate the DIAL knob to set the cursor to the "END" menu option, then press the [ENT(SET)] key.
12. Confirm that the cursor is on the "WRITE" menu option, press the [ENT(SET)] key.
13. The PMS memory programming process for this register is now completed.

Note: 50 PMS memories are available. You therefore can set upper and lower operation limits on a number of bands, if you like. Each PMS memory register, remember, stores both the lower and upper frequency limits.

Operation (Current PMS Register)

1. Press the [PMS(PMS SET)] key to initiate PMS scanning in an upward direction.
2. If the scanner encounters a signal strong enough to open the squelch, the scanner will halt and pause on that frequency. Scanning will resume according to the protocol you selected in the previous discussion.
3. To change to a different PMS frequency pair, press the numerical keys on the keypad corresponding to the PMS register you wish to use. For example, if you are on PMS register "00" and wish to use PMS register "03," press [0] + [3] while PMS scanning is engaged. Scanning will begin on the new register without further action.
4. To reverse the direction of the scan (i.e. toward a lower frequency, instead of a higher frequency), turn the DIAL knob one click in the counter-clock direction or press the [q(t)] key momentarily while the VR-5000 is scanning. To revert to scanning toward a higher frequency once more, rotate the DIAL knob one click clockwise or press the [p(u)] key momentarily.
5. Press the [V/M(MW)] key to disable the PMS scanner, and return to VFO mode.

Jock Elliott
lightkeeper@sprintmail.com

You Need One of These

Okay, listen up, people! Rachel Baughn, *MT*'s Editor, tells me there are folks out there who are fans of this column. I think that's terrific. I'm really grateful that you enjoy it, and you have my promise to do my level best to provide some interesting and useful reading.

Until now, though, you've pretty much had a free ride. Today, that changes: starting immediately, there is going to be a required piece of equipment for readers of *Easy Access Radio.* Here it is: you have to have a weather radio with alert capability.

If you're unfamiliar with the concept of weather radio, here's the deal: throughout the United States, the National Oceanic and Atmospheric Administration (NOAA) sponsors a network of radio stations that provide continuous broadcasting of the latest weather information from local National Weather Service offices. There are hundreds of these stations across the country, and they broadcast on one of seven frequencies:

162.550 MHz
162.400 MHz
162.475 MHz
162.425 MHz
162.450 MHz
162.500 MHz
162.525 MHz

The First Alert WX-17 offers AM, FM, 7 weather channels and weather alert. The WX-30 delivers all that plus clock radio functions.

This broadcast system also includes bulletins from the U.S. Emergency Alert System and the Federal Emergency Management Agency. When an immediate hazard – such as a tornado, hurricane, or chemical incident – threatens, the NOAA stations can transmit an alert tone that will activate weather radios equipped to receive it. While not all areas of the nation are covered by the NOAA weather radio network, most are, and the ability to receive a timely alert could be a lifesaver for you and those you love. (*MT*'s *Service Search* column concludes this month a listing of all NOAA weather stations; look up the one closest to you. The entire list is posted on the *MT* web site at ***http://grove-ent.com/mtnoaawx.html*** - *ed.*)

Notice, too, that every part of the country has some sort of severe weather: lightning, tornadoes, damaging winds, hail, extreme heat, extreme cold, flash floods, river floods, coastal storms, hurricanes, blizzards, ice storms, drought – even tsunamis.

On more than one occasion, the Elliott family, located in upstate New York, has spent the evening in the basement because severe thunderstorms were rolling through the area with a high likelihood of spawning tornadoes. The weather radio popped off an alert and advised: "Seek shelter immediately." We did, and sure enough, twisters raised havoc with a nearby town.

One evening in particular I recall because we lost power almost immediately, and I found myself trundling down the basement steps with an armload of gear including a weather radio and a very large shortwave radio that also receives the AM and FM broadcast bands. I remember thinking: "Wouldn't it be neat if somebody combined a weather radio with alert capability with a compact AM/FM portable?"

The good folks at Wireless Marketing must have been thinking along the same lines, because their new First Alert® WX-17 delivers all seven NOAA weather channels, alert capability, and AM and FM broadcast band reception. All this is in a package that measures just 7.25 x 4.5 x 1.5 inches (about the size of a trade paperback book) and weighs just a pound.

The WX-17 runs off four AA batteries, has a flip-out carry handle, and features an earphone jack, external DC power supply connector, and a telescopic antenna that extends about 16.5 inches.

On the front of the WX-17 are two light emitting diodes (one for low battery, the other for power), an on/off switch, and a plastic window that reveals an old-fashioned "sliderule" tuning setup. No fancy digital display to burn up batteries here, just Zen-like simplicity. On the top of the radio is a switch for selecting the weather band you want to hear, the flip-up carry handle, and the telescoping antenna.

On the left side, you'll find the headphone jack and the socket for the 6 volt DC external power supply. On the right side is a wheel for controlling volume, a switch for selecting AM, FM, weather band, or alert, and the tuning knob. On the back is the hatch for installing the batteries, and on the bottom are two molded feet for standing the WX-17 upright on a desk or table.

The performance of the WX-17 is highly satisfactory. The audio is clear, and the receiver pulls in stations nicely. This is one radio that deserves a place in your family emergency kit and will be a welcome companion wherever you need a portable radio. Even better, the suggested retail prices of the WX-17 is just $29.95 – that's less than many dedicated "weather only" portables.

For just a few bucks more ($44.95 srp) Wireless Marketing offers the First Alert WX-30 with seven weather channels, alert capability, AM/FM, alarm clock, and snooze and sleep functions. It offers similar performance in a larger package (5 x 6.25 x 3.5 inches). A backup 9-volt battery allows the WX-30 to be unplugged or used when the power fails.

For additional information, contact Wireless Marketing Corporation 1-847-839-0015, Monday - Friday, 8:00 am, - 5:00 pm Central Time, or visit ***http://www.wirelessmarketing.com***

What's NEW

Tell them you saw it in Monitoring Times

New Frequency Counter from Opto

The new DS1000 from Optoelectronics, Inc. is the first frequency counter to be capable of locking onto digital modulations such as TDMA, GSM, APCO 25, Tetrapol, On/Off Keying and other RF with a minimum pulse width of 500uS. The DS1000 also captures standard analog transmissions.

The DS1000 also incorporates Optoelectronics' patented Reaction Tune feature, though it operates only with analog signals. Using the built-in CI5 output, the DS1000 can automatically tune a compatible receiver to the analog frequency it captures. The DS1000 also has a built-in RS232 output for direct connection to a PC for the purpose of downloading the 1000 internal memories. It will record up to 65,000 hits.

Another unique feature of the DS1000 is its calibrated field strength meter. The signal strength of a near-field transmitter is measured and displayed in dBm. The frequency range of the DS1000 is 10 MHz to 2.6 GHz. The DS1000 can measure field strength from -45 to -5dBm.

The retail cost of the DS1000 is $529. The DS1000 comes with an AC90 power adapter, TA100S telescoping antenna, and RS232 cable / software for memory download.

For more information or to order, contact Optoelectronics, Inc., 5821 NE 14th Avenue, Ft. Lauderdale, FL 33334; Tel: 954-771-2050, Fax: 954-771-2052 ***http://www.optoelectronics.com***

Sony Prototypes Software Radio

Sony Computer Science Laboratories, Inc, has produced a prototype of its first software radio, named Software Programmable and Hardware Reconfigurable Architecture for Network (SOPRANO). Modulation, demodulation and other basic radio functions are implemented in software, which can be changed to allow a single unit to support multiple radio protocols.

The supported band is from 500 MHz to 9 GHz, meaning it can handle existing mobile telephones as well as third-generation (3G) mobile telecommunications (IMT-2000), wireless local area networks (LAN) and Bluetooth. The firm developed a frequency conversion integrated circuit (IC) using the Multiport Direct Conversion technique, for use in the SOPRANO 1.0 receiver.

The standard direct conversion scheme uses a mixer IC to convert the input into orthogonal (I/Q) signals, but because the mixer IC phase characteristics vary in frequency, performance degrades as bandwidth increases. The new approach adds the received signal to a reference (local oscillator) signal to generate three signals with phase differences.

These are amplitude-rectified, and the detected voltages are vector-processed to produce an orthogonal signal. Because the phase difference is used, instead of the phase itself, the variation is absorbed. The frequency conversion IC integrates three amplitude detectors and phase shifters, measures 2.4mm x 1.8mm, and has a peak current consumption of 3mA. It was manufactured with 0.5micron rule GaAs hetero junction bipolar transistor (HBT) technology. (January 2001, Nikkei Electronics Asia)

Modified Yagi Extends TV Reception

The new TERK TV35 is a combined VHF/UHF outdoor antenna that is designed to extend reception into the fringe areas of TV reception (with an amplifier). Ten antenna elements are designed to deliver high gain (VHF 0-4dB and UHF 2.5-8.5dB) at its operational bandwidth of 54 to 806 MHz. It measures 76-7/8 inches wide by 38-1/2 inches long and weighs a mere 2.65 lbs.

Constructed of heavy gauge aluminum and galvanized steel, the TV35 is designed to outlast most traditional Yagi antennas. The TV35's unique design, seamless welding, and sealed elements eliminate water from entering the elements, allowing the TV35 to withstand wind, ice and all types of weather conditions. Assembling the TV35 is as simple as assembling four elements, no tools required.

The TV35 carries a suggested retail price of $99.95. For information on a dealer near you and other TERK antennas, log in to ***http://www.terk.com*** or call 631-543-1900.

Manage your 780 with a PC

Trunking software for the Uniden BC780XLT is now available from Signal Intelligence, manufacturer of ScanStar and of GRE's Scanner Data Manager software for the RS PRO92 and PRO2067. TrunkStar780 requires Windows 95, 98, ME, NT4, 2000, XP and a computer system possessing 64 MEG RAM, 800 x 600 video, 233 MHz or faster.

Computer connection is through the serial port with any appropriate cable. Although TrunkStar780 is a stand-alone program, it uses the popular Scan*Star database format (.SWG files interchangeable) and features such as drag/drop, log to files, and built-in Digital Audio Logger.

Designer Sam Dunham says, "We will be offering spectrum analysis and band scope in a future 'pro' version, but unfortunately the BC780 does not allow the PC to take over full control of scanning."

Suggested retail is a competitive $64.97. For more information, visit the Signal Intelligence website at ***http://www.scanstar.com*** or call 1-408-926-5630 TEL or fax 1-408-926-0303.

What's NEW

Tell them you saw it in Monitoring Times

Sony 7600G vs 7600GR

Sony has recently introduced the 7600GR portable shortwave receiver to replace the 7600G. Differences between the two models are minimal: The GR adds a Hold button to prevent accidental changes to settings, 100 station memory presets, and a World Time Clock/Dual Clock display. The case color may also be changed but this was not known at press time.

Turbo535 Update

Jan Arkesteijn has released an update, ver 6, to his free JRC 535 radio control program, TURBO535, reports Al Dudley. "The Internet filenames are T535V6A.ZIP and T535V6B.ZIP, each about 2.3 MB. These files can be downloaded directly from ftp://ftp.funet.fi/pub/ham/rigctrl/ (in Europe) and ftp://ftp.qrz.com/files/controls/ (in the USA) On the same locations you can download separately the (text + picture) manual in PDF format, filename T535V6.PDF (333 kB). Window 95 or higher is needed to run this application."

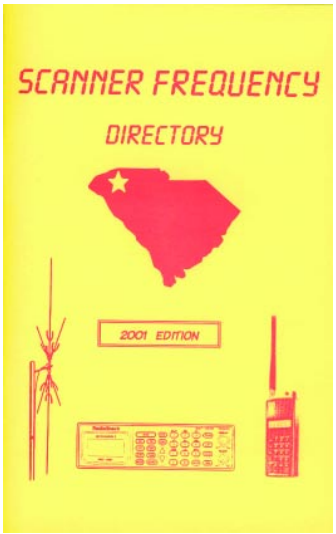
WiNRADiO Updates

A USB adapter for WiNRADiO external receivers (WR-XXXXe)is now available from WinRadio dealers for Windows 98 or 2000 users, as an alternative to using a serial cable connection. The USB cable option retails for US$49.95 from WiNRADiO dealers, including Grove Enterprises. For technical details see ***http://www.winradio.com/home/usb.htm***

Coming soon from WiNRADiO is a new Telephone Interface Unit which allows you to dial up your external "e" model WiNRADiO from anywhere in the world and control its frequency and other functions by simple telephone keypad entries. The remote control responds by voice, and allows you to listen to signals in real time right over the telephone!

An optional software package permits automated monitoring, logging, and recording of the audio signal as well as networking additional receiving platforms. Price is to be determined, but is expected to fall in the US$2000 range.

For more details see ***http://www.winradio.com/home/wtci.htm***



SC Scanner Frequency Directory

Radio Research

Larry Williams of Radio Research has put together the 2001 edition of this 80-page directory (5-1/2 x 8-1/2 inches). Since the receiving range in his area is around 90 miles in all directions, he has listed many agencies and municipalities in Western North Carolina and Northeast Georgia along with South Carolina frequencies.

Information is reported both by area or agency and by frequency order for useful cross-reference. Fourteen pages are devoted to Business/Industrial listings by frequency. 10 codes and other communications codes are included to help decipher what you hear. Trunked system and CTCSS (PL tone) information are included when known.

The author acknowledges that systems are in constant flux, especially since Nextel continues to buy up 800 MHz frequencies and they disappear as they are moved into digital communications. In spite of the challenge, he says "it is quite rewarding as all of the Radio Shack Dealer stores in this area use it as their #1 sales aid."

The booklet is $9.95 from local hobby stores, but for a $10 personal check the author will mail it to you First Class. Address your request to Radio Research, 10 Elf Lane, Greenville, SC 29617; 864-246-3261; *larryscan@netzero.net.*

The Hobbyist's Guide to COMINT Collection and Analysis

Tom Roach

COMINT is an acronym for communications intelligence. *The Hobbyist's Guide to COMINT Collection and Analysis* provides information on how easily the reader can collect and analyze COMINT. According to the author this can be done with radio receivers and "decoder" boxes which are easily purchased on the open market. The book describes some of the Russian and other messages Mr. Roach received using a shortwave receiver and decoder" while sitting in the comfort of his den.

The book includes technical descriptions of four distinctly different types of messages using Russian encryption methods which are still in use. The techniques discussed in this book can be applied to almost any sort of radio traffic. Roach also discusses how the Internet can be used to allow hobbyists to share information, get translations, and combine intercepts to gain greater insight into what they've heard.

The book comes with a convenient spiral metal binder so it can lay flat on the desk of the home. David Farber, who reviewed this book for an internet newsgroup, comments that the book would have benefited from some tighter editing. "Does this book reveal secret methods and classified government data? Is 'national security' threatened? The answer to both questions is no. Nothing here but common sense and the will to put together openly available information."

The Hobbyist's Guide to COMINT Collection and Analysis can be purchased directly from the author, and even autographed. The cost for US residents is $24, including shipping and handling; or $28 for overseas orders. Send checks or money orders (U.S. dollars only) to: Tom Roach, 1330 Copper Peak Lane, San Jose, CA 95120-4271; *troach@ix.netcom.com*

Books and equipment for announcement or review should be sent to " What's New?" c/o Monitoring Times, P.O. Box 98, 7540 Highway 64 West, Brasstown, NC 28902. Press releases may be faxed to 828-837-2216 or emailed to mteditor@grove-ent.com.

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Keaau, Hawaii

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- Don Nauer

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Ads for ***Stock Exchange*** must be received 45 days prior to publication date. All ads must be paid in advance to *Monitoring Times*.
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1-3/4" SQUARE DISPLAY AD: $50 per issue if camera-ready copy or, $85 if copy to be typeset. Photo-reduction $5 additional charge. For more information on commercial ads, contact Beth Leinbach, 828-389-4007.

Monitoring Times assumes no responsibility for misrepresented merchandise.

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Closing Comments

By Bob Grove, Publisher

Should a Professional Journalist Head the Voice of America?

Guest Editorial by Mark B. Lewis

As the fundamental mission of the Voice of America is to be an accurate and reliable source of news and information for radio listeners abroad, should the Bush administration choose a person with a professional journalistic background as the new Director of VOA? To gain perspective on the question, let's take a look at the record so far.

Selected by the Clinton administration in 1999, Sanford ("Sandy") J. Ungar will be leaving the VOA directorship in July to become president of Goucher College in Baltimore. He came to VOA with solid journalistic credentials as an editor, foreign correspondent, writer, radio talk show host and university dean of communications. But Ungar's two years at VOA were often stormy and frustrating, marked by a shrinking budget and program cancellations, lowering staff morale, and pressures from a seemingly micromanaging Broadcasting Board of Governors.

The late NBC News professional reporter John Chancellor, who was Director of VOA for two years during the presidency of Lyndon B. Johnson, found the job exciting and challenging. But Chancellor told friends that he was frustrated by government bureaucracy and bureaucratic procedures – and he had no Broadcasting Board of Governors.

Besides Ungar and Chancellor, only three other VOA Directors have been professional journalists: John Hughes (*Christian Science Monitor*); Eugene Pell (NBC News); and Kenneth Tomlinson (*Reader's Digest*). Chase Untermeyer, who effectively directed VOA during the Bush 1 era, had some experience as a newspaperman (*Houston Chronicle*).

"We haven't had enough VOA Directors with journalism backgrounds," according to the current VOA Program Director and veteran VOA executive, Myrna Whitworth.

The majority of VOA's directors were former executives in commercial broadcasting. One came from Public Broadcasting. Two VOA directors came out of diplomacy; one from advertising; one from academia; one from the field of music. The first Director of VOA in 1942 was a theatre director – producer, John Houseman.

One of the most successful directors was Henry Loomis. His background was in physics and in intelligence. Over seven years, 1958-1965, he expanded VOA technical facilities and programming for every part of the world. The guiding principles of VOA were written during the Loomis period and are on the walls of every VOA office today. They state unequivocally that VOA news must be accurate, reliable and objective; that VOA must present a balanced and comprehensive projection of American thought and institutions; and that VOA will present the policies of the U.S. clearly along with responsible discussion and opinion on these policies.

Mary Bitterman was another successful VOA Director who did not have a journalistic background. Appointed by President Carter, she came to VOA from Public Broadcasting, PBS Hawaii. She was 36 years old, the youngest ever to hold the top job and the first female director. She took the time to visit the studios during broadcasts and speak with announcers, reporters, producers and engineers. Above all, it is recalled by the then director of VOA news, Bitterman had knowledge of the history and culture of foreign countries receiving VOA programs.

Requirements of the Job

Currently president and CEO of public broadcasting's KQED in San Francisco, Bitterman believes there are four requirements for the job of VOA Director: (1) "A real understanding and respect for the people who work there and for their creative talents"; (2) "a journalism background is important but also an understanding of foreign affairs, knowledge of the world today"; (3) the capacity to understand new communications technologies; (4) the director must appreciate the importance of the position and be persuasive.

The magnitude of the job is reflected in what the independent VOA does: The Voice currently broadcasts in 53 languages to virtually every country in the world, except this one. Some 900 hours of radio programming leave VOA headquarters by satellite every week, bound for relay stations and transmitters, and for more than 1100 affiliate stations around the world. The audience, numbering an estimated 91 million people a week, listen to VOA on shortwave and medium-wave direct broadcasts, or through AM and FM rebroadcasting by affiliates. The biggest audience is in China. VOA provides a round-the-clock news service in English every hour, and VOA is increasingly reaching audiences through television and the Internet. VOA operates on an annual budget of a little over $105 million and has 1100 employees at home and abroad, including more that 25 foreign correspondents and news bureaus in the U.S.

It is a complex, high-pressure operation, and experienced VOA hands believe therefore that the first requirement of the next director should be managerial skill.

"Steering VOA is like navigating an aircraft carrier through a sea of syrup; you can move it about two degrees a year in any new direction, if you're lucky." Loomis once said.

There is widespread agreement that a VOA director should also have the ability to represent VOA effectively in Congress and with the governing Broadcasting Board in order to improve VOA's funding and that the director should have experience in foreign affairs, which the present Board lacks. Both these qualifications are especially important in today's post-Cold War world when VOA is often required to justify its continued existence.

No matter in what order the qualifications are ranked – professional journalist, good manager, foreign affairs experience, persuasiveness – finding them all in one individual is a tall order indeed. An experienced news executive would probably be best suited for the position, thus reflecting the importance of both a journalistic and management background.

Above all, VOA needs continuity. In its 59-year history, VOA has had 24 directors; with two exceptions, the average time in office has been less than two years! This represents an appalling absence of continuity.

In selecting Ungar's successor, the Bush administration should not tap an individual as a political payback, nor should the job be viewed as a brief stepping stone to something better. As John Chancellor has written, "the people at VOA are, to a remarkable degree, people of spirit and intelligence, whose passion is to represent the United States in the best possible manner." VOA directors should be non-political professionals appointed to terms of not less than five years. They – and the people they represent – deserve nothing less.

Mark Lewis, a retired Foreign Service Officer and former VOA newsman, has published articles about VOA in earlier issues of Monitoring Times

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— Passport to World Band Radio, 1998

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†Cellular frequencies blocked; unblocked versions available to FCC approved users. RCVRFAMMT401

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